

FIFTH REPORT

ROYAL COMMISSION

TECHNICAL INSTRUCTION AND THE  
ADVANCEMENT OF SCIENCE.

Printed by order of the House of Commons at the Command of Sir James Spence.

26

378.95

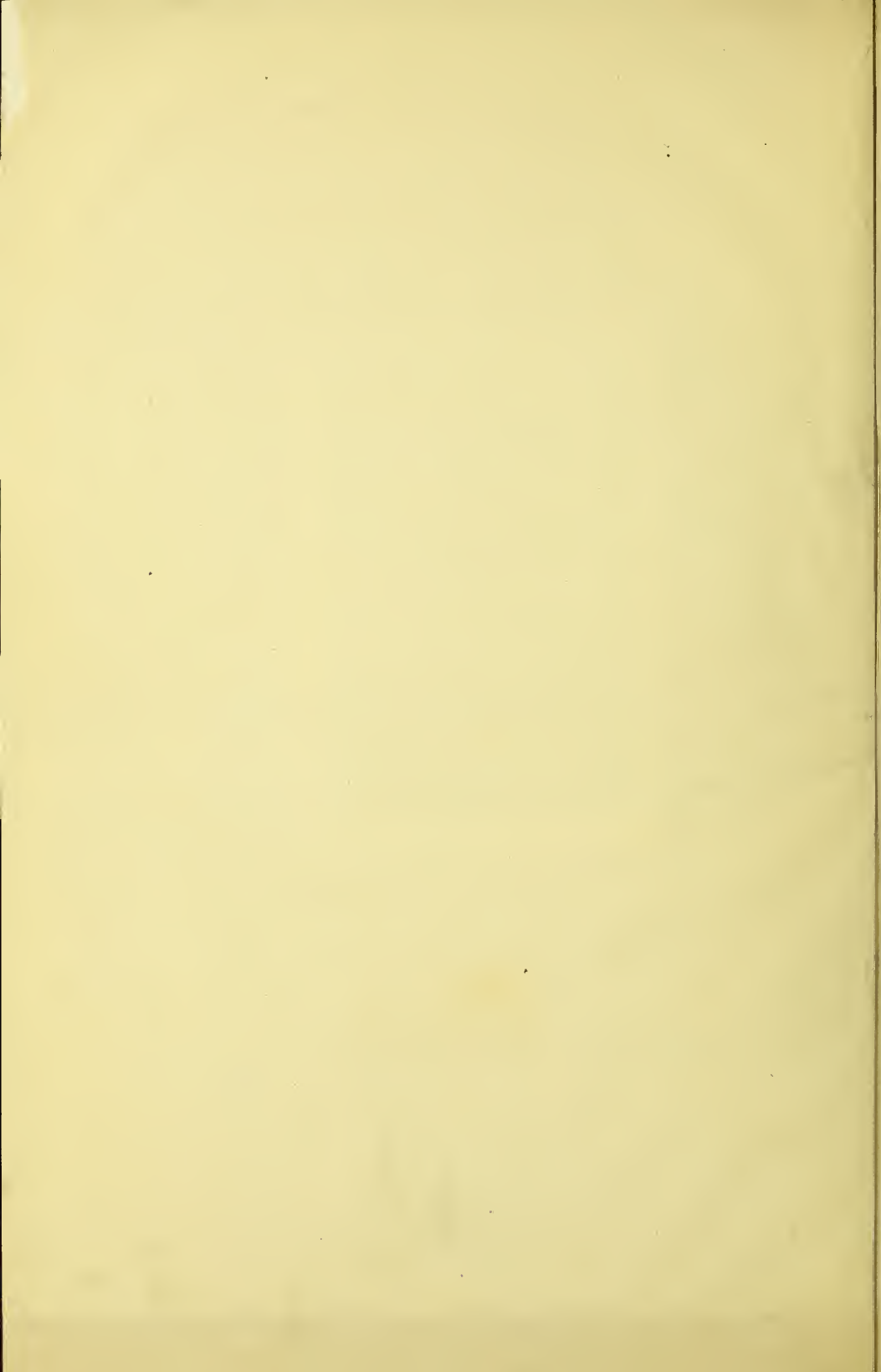


26-5-3









FIFTH REPORT

OF THE

ROYAL COMMISSION

ON

SCIENTIFIC INSTRUCTION AND THE  
ADVANCEMENT OF SCIENCE.

6.8.  
Presented to both Houses of Parliament by Command of Her Majesty.



LONDON:  
PRINTED BY GEORGE EDWARD EYRE AND WILLIAM SPOTTISWOODE,  
PRINTERS TO THE QUEEN'S MOST EXCELLENT MAJESTY.  
FOR HER MAJESTY'S STATIONERY OFFICE.

1874.



# CONTENTS.

	Page
COMMISSIONS - - - - -	iii
REPORT - - - - -	1
APPENDIX - - - - -	29

SL (A)

ROYAL COLLEGE OF PHYSICIANS LIBRARY	
CLASS	379.95
ACCN.	35563
SOURCE	Spec. Exam. Board
DATE	Dec 1968

Emg. gift



ROYAL COMMISSION ON SCIENTIFIC INSTRUCTION AND THE  
ADVANCEMENT OF SCIENCE.

---

*VICTORIA R.*

VICTORIA, by the Grace of God of the United Kingdom of Great Britain and Ireland Queen, Defender of the Faith, To Our Right Trusty and Right Entirely Beloved Cousin William Duke of Devonshire, Knight of Our Most Noble Order of the Garter,—Our Right Trusty and Entirely Beloved Cousin Henry Charles Keith Marquess of Lansdowne,—Our Trusty and Wellbeloved Sir John Lubbock, Baronet,—Our Trusty and Wellbeloved Sir James Phillips Kay-Shuttleworth, Baronet,—Our Trusty and Wellbeloved Bernhard Samuelson, Esquire,—Our Trusty and Wellbeloved William Sharpey, Esquire, Doctor of Medicine,—Our Trusty and Wellbeloved Thomas Henry Huxley, Esquire, Professor of Natural History in the Royal School of Mines,—Our Trusty and Wellbeloved William Allen Miller, Esquire, Doctor of Medicine, Professor of Chemistry in Kings College, London,—and Our Trusty and Wellbeloved George Gabriel Stokes, Esquire, Master of Arts, Lucasian Professor of Mathematics in the University of Cambridge, Greeting :

Whereas We have deemed it expedient for divers good causes and considerations that a Commission should forthwith issue to make Inquiry with regard to Scientific Instruction and the Advancement of Science and to Inquire what aid thereto is derived from Grants voted by Parliament or from Endowments belonging to the several Universities in Great Britain and Ireland and the Colleges thereof and whether such aid could be rendered in a manner more effectual for the purpose.

Now Know Ye that We reposing great Trust and Confidence in your Ability and Discretion have nominated constituted and appointed and do by these Presents nominate constitute and appoint you the said William, Duke of Devonshire—Henry Charles Keith, Marquess of Lansdowne—Sir John Lubbock—Sir James Phillips Kay-Shuttleworth—Bernhard Samuelson—William Sharpey—Thomas Henry Huxley—William Allen Miller—and George Gabriel Stokes—to be Our Commissioners for the purposes of the said Inquiry.

And for the better enabling you to carry Our Royal Intentions into effect We do by these Presents authorize and empower you or any three or more of you to call before you or any three or more of you such persons as you may judge necessary by whom you may be the better informed of the matters herein submitted for your consideration and also to call for and examine all such Books Documents Papers or Records as you shall judge likely to afford you the fullest information on the subject of this Our Commission and to Inquire of and concerning the Premises by all other lawful ways and means whatsoever.

And Our further Will and Pleasure is that you or any three or more of you do Report to Us under your Hands and Seals (with as little delay as may be consistent with a due discharge of the Duties hereby imposed upon you) your opinion on the several matters herein submitted for your consideration, with power to certify unto Us from time to time your several proceedings in respect of any of the matters aforesaid, if it may seem expedient for you so to do.

And We do further Will and Command and by these Presents ordain that this Our Commission shall continue in full force and virtue and that you Our said Commissioners or any three or more of you shall and may from time to time proceed in the

execution thereof and of every matter and thing therein contained although the same be not continued from time to time by adjournment.

And for your assistance in the execution of these Presents We do hereby authorize and empower you to appoint a Secretary to this Our Commission to attend you whose services and assistance we require you to use from time to time as occasion may require.

Given at Our Court at Saint James's, the Eighteenth day of May 1870, in the Thirty-third year of Our Reign.

By Her Majesty's Command,

H. A. BRUCE.

ROYAL COMMISSION ON SCIENTIFIC INSTRUCTION AND THE  
ADVANCEMENT OF SCIENCE.

---

*VICTORIA R.*

VICTORIA, by the Grace of God of the United Kingdom of Great Britain and Ireland Queen, Defender of the Faith, To Our Trusty and Well-beloved Henry John Stephen Smith, Esquire, Master of Arts, Savilian Professor of Geometry in Our University of Oxford, Greeting :

Whereas We did by Warrant, under Our Royal Sign Manual, bearing date the Eighteenth Day of May, One Thousand Eight Hundred and Seventy, appoint Our Right Trusty and Right Entirely Beloved Cousin, William, Duke of Devonshire, Knight of Our Most Noble Order of the Garter, Our Right Trusty and Entirely Beloved Cousin, Henry Charles Keith, Marquess of Lansdowne, together with the several Gentlemen therein named, to be Our Commissioners to make Inquiry with regard to Scientific Instruction and the Advancement of Science, and to inquire what aid thereto is derived from Grants voted by Parliament, or from Endowments belonging to the several Universities in Great Britain and Ireland, and the Colleges thereof, and whether such aid could be rendered in a manner more effectual for the purpose: And whereas since the issue of the said Warrant William Allen Miller, Doctor of Medicine, one of the Commissioners thereby appointed, hath deceased :

Now Know Ye, that We, reposing great Trust and Confidence in Your Zeal, Discretion, and Integrity, have authorized and appointed, and do by these Presents authorize and appoint you the said Henry John Stephen Smith to be a Commissioner for the purpose aforesaid, in addition to, and together with, the Commissioners now acting under the above-mentioned Royal Warrant.

Given at Our Court at Saint James's the First Day of December 1870, in the Thirty-Fourth Year of Our Reign.

By Her Majesty's Command,  
H. A. BRUCE.

Professor Henry John Stephen Smith, M.A.,  
To be a Commissioner for inquiring into  
Scientific Instruction and the Advancement of Science.

---





# FIFTH REPORT.

TO THE QUEEN'S MOST EXCELLENT MAJESTY.

MAY IT PLEASE YOUR MAJESTY,

We, the Commissioners appointed by Your Majesty to make Inquiry with regard to Scientific Instruction and the Advancement of Science, humbly beg leave to present to Your Majesty, in continuation of our former Reports, the following Report on certain Institutions of recent voluntary origin and mainly dependent on voluntary support, which have made arrangements for Advanced Instruction in Science.

The Institutions of this description to which our attention has been directed, and with regard to which we have taken Evidence, are the following :—

- I. The Two Metropolitan Colleges, viz. :—  
University College.  
King's College.
- II. The Owens College, Manchester.
- III. The College of Physical Science, Newcastle-upon-Tyne.
- IV. The Catholic University of Ireland.

## I.—THE TWO METROPOLITAN COLLEGES.

### UNIVERSITY COLLEGE, LONDON.

1. The history of this Institution, as briefly stated in its Calendar, is as follows :—  
It was founded in the year 1826, and opened on the 1st of October 1828, under the title of The University of London. It was incorporated as University College, London, by a Royal Charter dated the 28th of November 1836, which was annulled by an Act of Parliament passed on the 24th of June 1869, whereby the College was re-incorporated with additional powers and divested of its proprietary character. The purpose of the College, as expressed in the Act, is “to afford, at a moderate expense, the means of “education in Literature, Science, and the Fine Arts, and in the knowledge required for “admission to the Medical and Legal Professions, and in particular for so affording the “means of obtaining the education required for the purpose of taking the degrees now “or hereafter granted by the University of London.”

See App. I.

2. The College was in the first instance constituted as a joint stock company, and the original deed of settlement provided for a dividend not exceeding 4 per cent. on the share capital. But, as a matter of fact, no dividend was ever paid, the expenditure of the College having from the very first absorbed the whole of the receipts from that portion of the fees paid by the students which was applicable to the purposes of a dividend. The title of “The University of London,” which was at first assumed by the Institution, did not carry with it any of the privileges of an University, or the power of granting degrees. On the 26th of March 1835 the House of Commons adopted by a large majority an address to the Crown, praying that a Charter of Incorporation might be granted to “the University of London,” containing the power of conferring degrees, other than degrees in Medicine and Divinity. Instead of giving this power, the Government determined to found a new Institution, the present University of London; and it was proposed to the College, or University of London, as it was then called, that it should give up its title in favour of the new Institution then about to be founded, and should take instead the title of “University College, London.” This proposal the Council recommended the proprietors to accept, and it was accordingly accepted by them. It was one of the conditions of the agreement between the College and the Government, when the original title was given up, that the Institution should be incorporated by a Royal Charter. It would seem that it was intended that this Charter should extinguish the pecuniary rights of the proprietors. These rights were, however, not formally cancelled, and provision was made for the transference of the shares; although all reference to any pecuniary advantage to be derived from the possession of the shares was left out of the Charter. At a subsequent period doubts were entertained as to whether the Charter had so effectually extinguished the proprietary rights as to prevent them from becoming inconvenient at some future time; and the College, with the

Qu. 7132.

Qu. 7133.

unanimous approval of the proprietors at a General Meeting, determined to apply, and did successfully apply, for a private Act of Parliament to settle the question. The main object of the University College Act of 1869 was to secure the extinction of the proprietary rights, but at the same time the powers of the Institution were enlarged in several directions. It then obtained the power, which it had not before, of instructing women as well as men in the College, and also of giving instruction in the Fine Arts. The Act also gives the College a licence of mortmain up to a rackrent value of 10,000*l.* per annum, exclusive of its freehold site in London.

3. By the provisions of the University College Act the government of the College is intrusted to a Council elected by a General Meeting of its members. The Members of the College consist, first of the Governors, secondly of the Fellows, and thirdly of the Life Governors. The Governors represent the registered proprietors of the shares in the College, as it was constituted under the Royal Charter; and, although all their pecuniary rights have been abolished, the right of proprietorship is still so far preserved that every Governor has the privilege of nominating by writing under his hand some person, subject to the approval of the Council, to replace him in his lifetime, or to succeed him after his death as Governor. No such power of transmission is given to the Fellows or to the Life Governors. The Fellows are former or actual Students of the College, nominated by the Council, and admitted by a General Meeting of the Members. The Life Governors are similarly nominated, either by the Council, or by twenty members of the College, and are admitted by a general meeting. They are not, however, necessarily former students of the College, but must be persons having special claims to the distinction, which special claims the Council, or the nominators, are required to state in writing at the time when the nomination is made. The Council consists of a President, Vice-President, Treasurer, and not more than twenty-one or less than sixteen other members, to be elected at a general meeting, out of the members of the College. Six of the members of the Council retire every year, but are re-eligible.

4. The powers of the Council are very wide; it has "the sole and entire management and superintendence of the College, as well relating to the income and funds thereof as to the teaching of the various branches of literature, science, and art therein, and the appointment, suspension, and dismissal of professors, lecturers, and teachers, and all other the affairs and concerns thereof." The Council also has the government of the Hospital, which has been established in connexion with the College, and the control of its funds. The power of making byelaws, however, rests with the General Meeting of the Members.

5. The byelaws at present in force provide that no professor or holder of any other place of emolument in the College or Hospital shall hold the office of President, Vice-President, Treasurer, member of the Council, or Auditor, without vacating his professorship or other place of emolument. The effect of this byelaw is to exclude the professors, individually as well as collectively, from any direct share in the government of the College; but at the same time by another byelaw the professorial body is constituted into a Senate, which possesses no powers under the Act of Parliament, and which occupies with regard to the Council the position of a purely consultative body. The Senate is empowered to make suggestions to the Council with regard to the general management of the College, and especially of the libraries and the museum. Further, whenever a professorship or lectureship is vacant, the Council is required by the byelaws to communicate to the Senate the names of all the candidates, with their testimonials; or, if an advertisement has been dispensed with, the name and testimonials, if any, of any person whose appointment is under consideration. The Senate report their opinion, with their reasons, to the Council, and no appointment to a permanent professorship is to be made by the Council until either a report has been made to the Council, or until the time appointed for making it has expired. Similarly, the powers of the Council in removing any professor, lecturer, or teacher, are limited by the requirement that the Council should previously send to the Senate a written statement of the grounds on which his removal is proposed, and should request the opinion of the Senate thereupon. This scheme of government possesses several obvious advantages, and has been found in practice to work very well. The Council naturally attaches great weight to the opinion of the Senate on any academic question; and the Professors thus exercise a very substantial, though indirect, control over the management of the College as a place of education, while at the same time they are relieved from the duty of attending to the details of its financial business.

6. The expenditure of the College on Capital account up to the year 1870, amounted to 202,287*l.*, and was incurred as shown in the following statement :



	£
Freehold land - - - - -	30,000
Buildings and furniture - - - - -	125,070
Books - - - - -	4,425
Anatomical and Materia Medica Museums - - - - -	6,153
Chemical, Physical, and Physiological Apparatus - - - - -	4,336
Museum of Comparative Anatomy and Zoology - - - - -	602
Birkbeck Laboratory of Chemistry - - - - -	3,128
Expenditure on maintenance in addition to the College share of fees - - - - -	18,393
Amount paid to Professors in augmentation of fees, and for annuities and pensions - - - - -	10,180

7. The whole of this expenditure has been defrayed out of the original share capital of the College, and out of the sums that have been either given or bequeathed to it for general purposes from time to time. A portion of these expenses, viz., the items of 18,393*l.* for expenditure beyond the College share of fees, and 10,180*l.* paid to professors in augmentation of fees and for annuities and pensions, were not properly chargeable against the capital of the College, as they represent ordinary expenditure, which ought to have been defrayed out of the annual revenue; but the Council considered themselves justified, and no doubt were justified, in trenching upon the capital of the College for the purpose of maintaining its efficiency. In addition to the capital sum which has been expended as shown above, there are endowments arising out of various bequests which produced, in 1870, an annual income of 2,978*l.* Of this income 2,276*l.* is appropriated to special purposes. No assistance has ever been received from any Government grant.

Qu. 7132.

Vol. I.  
App. XIII,  
p. 42.

8. A school into which boys are admitted at any age between seven and fifteen has been established in connexion with University College. It forms a distinct branch of the College, and its pupils are entirely separated from the students. The Head Master is appointed and is removable in the same manner in all respects as a Professor of the College, and is subject to the control and regulations of the Council. The numbers of the school during the last few years have rapidly augmented, and the instruction in Mathematics and in some branches of Natural Science has received a very considerable development. The connexion with the School is of unquestionable advantage to the College, as a large and increasing proportion of well-prepared pupils pass from the former to the latter. The establishment of the School must originally have involved a large outlay; but during the last few years the College, in a financial point of view, has not been a loser but a gainer to a slight extent by the maintenance of the School. We are informed that the financial relations between the two branches of the Institution have "recently been carefully investigated by the School Committee of the Council, and it has thus been ascertained that for the last five years —the most prosperous in the history of the School—the net amount received from the School by the College for its general purposes has been only an average of 982*l.* 6*s.* 8*d.* per annum. But even this is subject to a large deduction for *rent*, which may be moderately estimated at 750*l.* a year for the south wing, and of 150*l.* for the portion of the main building still occupied by the School. Thus the actual profit derived from the School is reduced to about 100*l.* a year."

Appendix I.

9. There are three Faculties in University College:—(1) of Arts and Laws, (2) of Science, (3) of Medicine. There is also a Department of Civil and Mechanical Engineering.

10. The number of Professorships in the first two Faculties is thirty-one. Of these the scientific chairs are the eleven following:—(1) a Professorship of Mathematics, (2) of Applied Mathematics and Mechanics, (3) and (4) of Chemistry and Applied Chemistry (these two chairs being at present held by the same professor), (5) of Physics, (6) of Engineering, (7) of Zoology, (8) of Botany, (9) of Geology and Mineralogy, (10) of Physiology, (11) of Practical Physiology and Histology. There is, besides, a Professorship of Architecture and Construction. Of these eleven professorships, one only is endowed, Mr. T. J. Phillips Jodrell having lately presented to the College the sum of 7,500*l.* for a permanent endowment of the Chair of Physiology. Mr. Jodrell's object in founding this endowment, as stated in the deed of foundation, was to "promote the study of Human Physiology in University College, London, and especially to encourage original research in combination with professorial teaching," and "to ensure such a provision for the professorship as shall induce men of eminence and ability, who may be willing to cultivate science for its own sake, to forego more lucrative sources of emolument, and to undertake the office on the condition of devoting to original research, either in connexion with this professorship, or any other work of a kindred nature which shall be essential and auxiliary to such research, all the time that can be



“spared from the work of a lecture room.” The report of the Council on February the 25th, 1874, states that Mr. Jodrell has signified his intention of presenting the College with a further sum of 500*l.* to be applied, under the direction of the Jodrell Professor of Human Physiology, in the purchase exclusively of such additional apparatus as may be required for the effectual prosecution of original research, and that this sum will be paid over to the College as soon as provision has been made for the reception of the apparatus, arrangements for making which provision are now in progress. With the exception of this recent benefaction, the College can hardly be said to possess any endowment whatever the revenue of which is properly applicable to the support of its Scientific Faculty. The Professor of Geology, however, receives 31*l.* per annum from the Goldsmid Fund.

11. The courses of study, as indicated in the programmes of the professorial lectures, appear to be carefully arranged with a view to the requirements both of elementary and of advanced students. Great importance is attached to the laboratory instruction in Physics, Chemistry, and Physiology.

12. The College has but few Scholarships or Exhibitions, and of these none are appropriated exclusively to scientific subjects.

13. The College possesses a valuable Library, consisting of upwards of 68,000 volumes and 16,000 pamphlets, a great part of which has been derived from gifts and bequests. Within the last few years the libraries of Mr. James Morris and of Mr. J. T. Graves, the latter containing a splendid collection of works on Mathematics, Physics, and Astronomy, have been bequeathed to the College.

14. The Report of the Council already referred to states that during the Session of 1873-74 the number of pupils was 1542; of these 893 were Students in the College, and 649 Pupils in the School. Of the Students, 322 belonged to the Faculty of Medicine. In the Faculties of Arts and Laws and of Science there were 571. The fees received, exclusive of those for clinical instruction, amounted to 24,266*l.* 10*s.* 6*d.*, this sum consisting of the following items:—

	£	s.	d.
Fees for attendance on the Classes of the Faculty of Medicine	6,112	11	6
Fees for attendance on the Classes of the Faculties of Arts and			
Laws and of Science	7,053	18	0
School fees	11,100	1	0

15. The total payments out of these fees to the professors, teachers, and masters amounted to 16,904*l.* 8*s.* 6*d.*, leaving 7,362*l.* 2*s.* for the College share of fees.

16. In addition to the above-stated amount of fees, the sum of 2,010*l.* 7*s.* 0*d.* was received for clinical instruction in the Hospital, but these fees, as has always been the practice in this hospital, were devoted to the support of the hospital. The preamble of the University College Act recites that in the year 1832 the College appropriated “a certain portion of its land for the erection thereon of a Hospital in connexion with the Medical School of the College, and the Council obtained subscriptions from the proprietors of the College and others, whereby the North London or University College Hospital was erected on the said land, and the said hospital has since been supported by annual subscriptions, and by donations and bequests, and also by means of the fees of students of the College attending the hospital, which fees have for that purpose been relinquished by the medical officers of the hospital appointed by the Council; and the government of the hospital and of its funds since its foundation has been in the hands of the Council, who have from time to time made and altered the rules for the management thereof; and the College is now possessed of considerable investments for the benefit of the hospital.” It may be added that in 1838 the College gave 500*l.* as a contribution towards building one of the wings of the Hospital. As to the present financial relations of the Hospital to the College, the Secretary, Mr. Robson, states that—

“The College discharges gratuitously all the duties of Trustee for the hospital; it manages the investments of the hospital funds, conducts the correspondence connected therewith; acts as the guardian of the legal rights of the charity, and in various other ways carries on what may be called its *external* affairs, defraying out of its own funds the expenses incidental to its connexion with the hospital. Besides this, it pays each of the two Holme Professors, one of Clinical Medicine, the other of Clinical Surgery, a stipend of 100*l.* per annum, out of the income of the Holme Fund, which was bequeathed to the College ‘for the purposes of its Medical Department.’ The duties of these Professors are discharged wholly within the hospital, which derives an important part of its income from the fees paid by the students for hospital practice and clinical instruction.”

17. The evidence which has been laid before us clearly shows that the usefulness of

the College is greatly restricted by the insufficiency of its funds. The difficulty is felt in two respects principally; first, in providing adequate payment for the professors and their assistants, and, secondly, in providing laboratory accommodation upon a sufficient scale, together with the proper appliances for instruction and research.

18. The following are schedules of the payments received by the Professors in the session of 1872-73, and of the lectures and other instruction given by them in each academical year :

## SCHEDULE OF PAYMENTS.

Subject.	Share of Fees.	Endowment.	Total.	Remarks.
	£	£	£	
1. Mathematics - -	370	—	370	The Professor pays about 50 <i>l.</i> to an assistant.
2. Applied Mathematics -	123	200	323	The endowment is guaranteed by the Treasurer of the College for 5 years, of which 2 are unexpired.
3. Physics - - -	252	—	252	—
4. Chemistry - - -	1,484	—	1,484	This is subject to a deduction of between 400 <i>l.</i> and 500 <i>l.</i> for payment of assistants and other expenses.
5. Geology and Mineralogy	55	31	86	—
6. Botany - - -	184	—	184	—
7. Comparative Anatomy and Zoology.	104	100	204	—
8. Physiology - - -	468	—	468	—
9. Practical Physiology -	368	—	368	The Professor has to pay an assistant.
10. Engineering - - -	102	—	102	—

## SCHEDULE OF LECTURES.

Subjects.	Lectures per Week.	Lectures per Session.	Remarks.		
		(about)			
1. Pure { Lectures -	9	300	The Professor is more or less occupied daily in superintending the students, but no estimate of the time thus occupied can be given.		
Mathematics { Exercise Classes -	6	200			
2. Applied Mathematics - -	9	300			
{ Lectures - -	6	200			
3. Physics { Exercise Classes -	4	130	The Professor is usually engaged at the College the whole day.		
{ Laboratory - -	Daily from 10 to 5.				
4. Chemistry {	Lectures - -	5		} 240	
	Practical Chemistry -	(6 months). 8			
	Exercise Classes -	(3 months). 4			} 100
	Laboratory Work -	(6 months). Daily from 10 to 4.			
5. Geology and Mineralogy -	2	60	The above remark as to the Physical Laboratory applies to this Laboratory also.		
	(7 months).				
6. Botany - - -	5	60	The Professor is also occupied in the Museum of Geology, and in excursions with the students.		
	(3 months).				
7. Comparative Anatomy, and Zoology.	5	200	The Professor is more or less occupied daily in superintending the students.		
8. Physiology - - -	(9 months). 5	150			
	(6 months). 7	180			
9. Practical Phys- } Lectures -	Daily from 9 to 4 throughout Session.				
iology and } Laboratory Work.					
10. Engineering with Engineering Drawing.	13	420			



19. It will be seen from the above schedules that the Professorships, with perhaps one exception, are very inadequately remunerated.

20. The emoluments of the Professors, excepting as shown in the first schedule, are derived from a share of the gross fees paid by the students, which are divided between the College and the Professors according to a sliding scale, so arranged that in the case of the larger classes the College receives one third of the fees. In the opinion of the Secretary, "the large deductions from the fees which the College is obliged to make in order to provide for the current expenses of the institution, have a twofold injurious effect. They materially diminish the remuneration of the professors, and so far tend to deprive the College of the services of able men, and by rendering it necessary to charge fees higher than might otherwise be requisite, they must have the indirect effect of keeping down the number of our students. The result is that our Professors as a rule are very inadequately paid." The natural consequence of the inadequacy of the professorial stipends is, that in many cases the College has found it impossible to retain the services of some of its most distinguished Professors. Some striking instances of very recent occurrence, which show the disadvantage at which the College is placed in this respect, are mentioned in the evidence.

21. With regard to the second point, it is stated that the resources of the College have been quite inadequate to provide suitable and sufficient laboratories, apparatus, and assistance for the practical departments of experimental science. The laboratories have recently been extended and improved; but in order to provide for all the requirements of the professors, they would need to be much larger than they now are, and to be better supplied with fittings and apparatus. With especial reference to the Physical Laboratory, it is stated by Mr. Robson that "when the present Professor of Physics was elected he pointed out to the Council the importance of having the means of giving practical instruction in the various subjects which he had to teach, and the Council complied with his suggestions as far as they had the means of doing so. Those means were so limited that they were sufficient merely to fit up one of the ordinary rooms as a physical laboratory, and to add a considerable quantity of modern apparatus to the stock which we previously had. The professor went over that stock very carefully, and drew up a long catalogue of the apparatus which he considered indispensable for carrying on his work, and the Council gave him what he said was absolutely necessary at once, but were compelled to withhold a large portion of what he wanted and which he said would be extremely useful." The Professor himself considers that his department is still to a great extent in want of apparatus, as well as of more suitable rooms.

22. The Chemical Laboratory, which is known by the name of the Birkbeck Laboratory, was not provided wholly out of the funds of the College. About a third part of the sum which was expended on it was obtained from subscriptions raised by a number of Mechanics' Institutions in various parts of the country in honour of the man who first suggested their foundation. With regard to this laboratory, Professor Williamson states: "The public laboratory which is attended by the students is supplied by the College with the stock apparatus, which is kept up partially by a moderate sum which is spent every year in renewing and repairing the apparatus. The Council are very considerate in the matter. I believe they have never refused anything in that way which I have asked for; but I conceive that that is only due to the fact that my requests have been exceedingly moderate, because I knew that I should very soon get to the limit of their power of supplying them. I do not remember a case of their declining to give me anything I asked for . . . . . As to the extent of the laboratories, there are important wants for operations of greater nicety, but the general accommodation is not unsatisfactory." The important wants referred to are rooms "for gas analyses, and for operations requiring high temperatures and requiring furnaces; the accommodation for such purposes being at present scanty." Professor Williamson adds: "The first thing I should wish to do, if I had had the command of more money for the purpose, would be to get better illustrations for my lectures and better apparatus for the laboratory. I should also use available money for apparatus and materials, and for assistants in original research, and that is the bigger item of the two." The working space in the Birkbeck Laboratory is stated to be only sufficient to accommodate twenty-four students, and this number is accommodated only by allowing less space to each student than in laboratories of more recent foundation, such as that at Bonn, for example.

23. Proposals for the extension of the College buildings appear at various times to have come under the consideration of the Council, but no definite action has been taken with regard to them. Mr. Robson believes :—

“That if the Council had the necessary funds at their disposal, they would take steps to complete the two wings, already partly erected, and thus carry out the original design of the College, so far as its *extent* is concerned. Judging from estimates made at various times by our architect, I conclude that the cost of the work in question would be upwards of 40,000*l*.”

App. p. 1.

“Among the *uses* to which the additional buildings could advantageously be put, I may mention, in the first place, laboratories for Practical Physics, and for original physical research; next workshops attached to the Class of Engineering; accommodation of this kind has been greatly needed for several years past, and the want of it, there is good reason to believe, has been a serious obstacle to the full development of both the departments of the College affected by it.

“Greater space could be beneficially devoted to providing more extensive and complete accommodation for the teachers and the students engaged in the classes of Chemistry and of Practical Physiology.

“Laboratories for original chemical research, and for the practical applications of chemistry, would also require much space as well as expensive fittings and apparatus.

“The whole of the south wing, when completed, would probably be required for the use of the School, if, as there is every reason to expect, the number of its pupils should go on increasing for the next few years, as it has continuously for the past six or seven years. A large portion of the wing last built, which was finished in September 1873, having been assigned to the classes of Practical Chemistry and of Physics, to which subjects great attention is paid in the school, it is found that less accommodation than had been anticipated is available for ordinary classes, so that the school is already again cramped for space.”

#### KING'S COLLEGE, LONDON.

24. King's College was founded by Royal Charter in the year 1828, “for the teaching of various branches of Literature and Science, and also the doctrines and duties of Christianity as the same are inculcated by the United Church of England and Ireland.” The College was erected, on a site granted by the Crown, with money raised partly by shares and partly by donations, there being no grant whatever from the Government towards the erection of the building. It is stated in a document issued by the Council of King's College in 1871, that “a number of its original promoters, both donors and shareholders, withdrew their support at the last moment in consequence of certain political differences with which the College itself was entirely unconnected, leaving 12,000*l* of shares forfeited, besides promised donations, of which the amount cannot now be ascertained, but it is believed to have been at least 3,000*l*. The debt thus involved in the building of the College has been in regular course of liquidation by a sinking fund which is rigorously kept up. On the other hand, new buildings have been needed, and consequent debt has from time to time been incurred in order to meet the requirements of efficient teaching, and especially the increased demands of Physical Science, for which more accommodation is still urgently needed.”

See App. II.

Calendar  
1873-4,  
p. 62.

25. The proprietary rights of the original shareholders and of donors have never been entirely extinguished, although they appear to be limited in point of fact to the right of nominating pupils to the School or to the College at a slightly reduced fee, and even this right is but seldom exercised. The proprietors are precluded by a provision in the Charter from receiving more than four per cent. per annum upon the amount of their shares; but as there has never been any divisible surplus they have received no dividend whatever.

The proprietors.

26. The official title of the Corporation is “The Governors and Proprietors of King's College, London.” Its government is vested in a Council, which reports annually to the Court of Governors and Proprietors. The Council consists altogether of forty-two members, nine of whom are the official Governors; one is the Treasurer; eight are life Governors; and the other twenty-four, of whom six go out every year, are elected by the Court of Proprietors from a list prepared by the Governors, and containing twice as many names as there are vacancies. The Official Governors are the Lord Chancellor, the Archbishop of York, the Bishop of London, the Chief Justice of England, the Secretary of State for the Home Department, the Speaker of the House of Commons, the Lord Mayor of London, and the Deans of St. Paul's and Westminster. The Life Governors are appointed, as vacancies occur, by the Archbishop of Canterbury, who is the Visitor of the College. The elected members of the Council must be members of the Corporation; and it is further provided in the Charter that “no person who is not a member of the United Church of England and Ireland, as by law established, shall be competent to act as Governor by virtue of his office, or to be nominated or act as Life Governor, or be eligible as a member of the Council, or to fill any office in the College, except only the Professorships of Oriental Literature and Modern Languages.” The Council has “full power, from time to time, to appoint, and, as they shall see



" occasion, to remove, as well the Principal, or other head, the Professors, Tutors, " and Masters, as also the Secretary and all officers, agents, and servants of the said " College." It has also the entire management of and superintendence over the affairs, concerns, and property of the College, and in all cases not provided for by the Charter, it is empowered to act in such manner as it may deem best calculated to promote the welfare of the College. It may further make, and vary any byelaws and regulations, touching the government of the College, the appointment and removal, number and rank, powers and duties, stipends and emoluments, of the several persons employed, and the terms and conditions upon which students shall be admitted. The appointment, or dismissal, of the Principal and of the Head Master must be confirmed by the Governors; and their consent is also requisite for the validity of any " fundamental regulation " affecting the discipline and course of education in the College.

27. The following is a statement of the expenditure of the Capital funds of the College from its foundation to the present time :

	£	s.	d.
Freehold lands, exclusive of site granted by the Crown	-	16,448	0 0
College and School buildings and fittings	-	146,899	0 0
Fittings for museums and laboratories	-	5,738	0 0
Cost of books for general and medical libraries	-	5,296	11 5
Cost of museum and laboratory apparatus	-	6,039	14 4

28. The College possesses no Endowment applicable to General Purposes (other than the buildings, &c., upon which its capital has been expended). There are, however, endowments amounting in all to about 21,500*l.*, and producing an annual income of about 880*l.*, which are specially appropriated to certain prizes, scholarships, and professorships, none of which are scientific. In fact the whole of the expenditure required for the ordinary every-day work of the College has to be defrayed out of the fees paid by the students.

29. The general education of the College is carried on in six distinct Departments, (1) the Theological Department; (2) the Department of General Literature and Science (of this there are three divisions, the Classical, the Modern Division, and the Oriental; (3) the Department of the Applied Sciences; (4) the Medical Department; (5) the Evening Classes; and (6) the School. The whole of the arrangements of the College are under the supervision of a Principal, for whom a house is provided in the College building. The management of the School is left to a great extent in the hands of the Head Master, subject to consultation with the Principal.

30. The Students are divided into two classes, the Matriculated and the Occasional students. The Matriculated Students are those admitted to the regular and full prescribed course of study. The Occasional Students are those who, being unable to attend the whole course, are desirous of pursuing any particular subject. The Matriculated Students are expected to attend the daily service in chapel, unless specially exempted by the Principal. An exemption is allowed in all cases of conscientious objection. As, however, no register is kept of the attendances, the exemptions are not often applied for. Divinity Lectures form a part of the regular course in all the Departments, but exemptions from attendance at these lectures are likewise readily granted. As has been stated above, the Charter requires that the Professors should be members of the Church of England. No very stringent test, however, is applied in practice. In reply to the question, "What is the nature of the declaration of conformity?" the Principal states that the candidate does not sign any declaration whatever, but simply says, I am a member of the Church of England.

31. The Scientific Professorships in the Department of General Literature and Science are (1) a Professorship of Mathematics, the Professor having the assistance of three lecturers; (2) of Natural Philosophy; (3) of Chemistry; (4) of Mineralogy; (5) of Geology (the Professor of Geology has also the assistance of a lecturer); in addition to these there are in the Department of Applied Science, Professorships (6) of the Arts of Construction; (7) of Manufacturing Art and Machinery; (8) of Surveying and Levelling; (9) of Drawing (Geometrical, Engineering, and Freehand); and, in the Medical Department, Professorships (10) of Botany; (11) of Comparative Anatomy; (12) and (13) of Physiology and Practical Physiology, the last two being held by the same Professor. The Professor of Natural Philosophy has one Demonstrator, and the Professor of Chemistry two; there is also a Lecturer in Photography. A schedule is annexed of the stipends received by the Scientific Teaching Staff, not including the payments for the Evening Classes (which, however, are very small in amount) in the year 1873:—

Subject.	Stipend of Professors.	Number of Lecturers and Demonstrators.	Aggregate Stipend of Lecturers and Demonstrators.
	£ s. d.		£ s. d.
Mathematics - - - -	466 8 6	3	545 8 6
Natural Philosophy - - -	424 12 5	1	132 3 4
Chemistry - - - -	604 17 0	2	337 3 4
Practical Chemistry - - -			
Mineralogy - - - -	65 0 3	—	—
Geology - - - -	78 4 3	1	31 18 9
Botany - - - -	134 8 10	—	—
Comparative Anatomy - - -	50 0 0	—	—
Physiology - - - -	278 14 10	1	100 0 0
Arts of Construction - - -	100 5 5	—	—
Manufacturing Art - - -	180 1 6	—	—
Surveying - - - -	187 19 0	—	—
Drawing - - - -	190 17 4	1	26 15 0

This schedule shows that, as in the case of University College, the teaching staff is very inadequately paid.

32. Great attention is paid at King's College to the Department of Applied Science, which is intended chiefly, but not exclusively, for engineering students, and students of manufacturing art. This Department appears to have met with a considerable amount of success, and there is evidence that the instruction given in it is highly esteemed by professional men. The following statement, laid before us by Professor W. G. Adams, describes the arrangements of this Department :—

“ At King's College the course is divided into three sessions, with three terms in each session, affording Qu. 6885. about 11 weeks' actual tuition in each term, and includes the following subjects :—

	1st Session. Hours Weekly.	2nd Session. Hours Weekly.	3rd Session. Hours Weekly.
Pure Mathematics - - - -	5	5	5
Natural Philosophy { Mechanics (theoretical and practical) - - - -	3	4	2 $\frac{3}{4}$
Physics - - - -	2	1	1 $\frac{1}{4}$
Physical laboratory - - - -	0	0	1 $\frac{1}{2}$
Mechanical workshop - - - -	3	4	4
Chemistry - - - -	2	2	0
Practical Chemistry - - - -	0	0	2
Civil Engineering and Architecture - - - -	0	2	1
Machinery and Mechanical Engineering - - - -	2	2	0
Mechanical and Engineering Drawing - - - -	7	6 $\frac{1}{2}$	6 $\frac{1}{2}$
Surveying and Levelling - - - -	2	2 $\frac{1}{2}$	2
Mineralogy - - - -	2 in two terms	2 in two terms	0
Geology and Mining - - - -	1 in one term	3 in one term	3 in one term
Photography - - - -	0	0	2
Total (about) - - - -	28	31	30
Fees for this course - - - -	£42	£42	£45

Library and Matriculation fees, &c., 5*l.* 17*s.* 6*d.*, to be paid on entrance.

“ The professors of civil engineering and mechanical engineering require, at regular intervals, essays on some practical subjects from third year students.”

“ In addition to one lecture in each week during the first two sessions, the professor of mechanical engineering takes the students in his classes to visit manufactories in the neighbourhood of London. The average time is thus two hours a week for each session.”

“ In addition to, or instead of certain parts of this, the regular course, the second and third years' students can, and frequently do, attend and receive instruction in the chemical or the physical laboratories, which are open to them and to others (occasional students) for several hours daily, on payment of an extra fee of from 4*l.* 4*s.* to 8*l.* 8*s.* a term, or 10*l.* 10*s.* to 21*l.* for three terms, and in which there is always a professor or demonstrator to give instruction and assistance. The engineering drawing class is also open for three hours daily (except on Saturday), and the mechanical workshop (in which the first year's students do wood work, and the second and third years' students do metal work) is open for six hours daily (except on Saturday, when it closes at 1 p.m.), and in each case there is always some one to give instruction and assistance.”

Professor Adams adds: “ We have every means at King's College that can be pro- Qu. 6892.



" vided for the education of engineers, except the practical engineering itself, and for  
 " that it would be necessary that our students should go to a practical engineer to finish  
 " acquiring a knowledge of the profession, but we have everything preparatory to that  
 " in our present course at King's College; the course is complete for civil or for mecha-  
 " nical engineering." For some years past the number of students in this department  
 has ranged from 75 to 95.

33. The evening classes at King's College have been eminently successful, and provide a fairly complete course of scientific instruction for persons who are unable to attend the day classes. They were attended in 1873 by as many as 550 students, the majority of whom attended more than one class; about 300 of the 550 attending Science Classes. The students at the evening classes are usually clerks, either in the Civil Service, or in mercantile, architects', or engineers' offices.

34. The School appears to be in a flourishing condition, and its numbers are rapidly increasing; they amounted in the year 1872-3 to 456, and in the year 1873-4 to 521, the highest point that they have yet reached. The financial relations of the School to the College are substantially the same as at University College.

35. As in the case of University College, it is stated that in King's College the chief impediment to its further success is "that it is so extremely poor." The Secretary, Mr. Cunningham, says, "Our original subscriptions were 15,000*l.* short of the sum that was actually wanted for the building, and although the Council has for many years insisted on putting by 500*l.* a year to pay off the debt, yet the increase of new wants has been so great that the original debt remains very much the same now as it did originally." "Science in all its departments" is said to have been "the chief source of permanent outlay of late years. In the first place, the Council, only a few years ago, spent 5,000*l.* in building a new Hospital, with the simple object, as far as they were concerned, of providing Clinical Teaching for their Medical Students. Within the last five years they have spent 2,000*l.* on a new Museum, and 2,000*l.* on Chemical and Physical Laboratories. And now, at the present moment, they have a further demand of, I suppose, 1,500*l.* more for the new subject of Practical Physiology." The Scientific Departments as a matter of profit and loss do not add to the resources of the College. The Department of Applied Sciences may be said almost to pay its own way, but the Medical Department has always been worked at a very heavy loss. The evening classes, for which very moderate fees are charged, and for which the Professors are very poorly remunerated, contribute little or nothing to the support of the College. The Theological and Literary Departments are, financially, more successful; and may be said to keep the College afloat. The teaching staff is paid upon the principle of dividing amongst the Professors and Lecturers in each Department three fourths of the fees paid by the students of that Department, the College reserving to itself the remaining fourth part, out of which it has to pay the whole expenses of the buildings, the interest on the debt, and the salaries of the Principal, the Secretary, and the clerks. But the Professors do not always get their three-fourths. "The Council have for the last 10 or 12 years insisted on there being 500*l.* clear profit made every year, and if that clear profit is not made, the professors have to make good the deficiency out of their next fees. This time last year the Council had to charge 3 per cent. upon the whole staff to cover the deficiency of 1869, and this year they have had to charge one and a half per cent. for the expenses of 1870." The Council has frequently to refuse applications for increased grants from the various Departments.

36. Great efforts have been made and are still being made by the Council to raise an endowment fund of 30,000*l.*, between 11,000*l.* and 12,000*l.* of which has now been subscribed. It is proposed to apply this fund partly in liquidation of the existing debt of 15,000*l.*, and partly in extending and improving the educational appliances of the College.

#### GENERAL REMARKS ON THE TWO METROPOLITAN COLLEGES.

37. We infer from the evidence laid before us that a strong feeling exists on the part of the persons interested in University and King's Colleges, that these Institutions have to contend upon very unequal terms against the competition of highly endowed Colleges and Schools, and especially of Institutions supported wholly or in part by Government. There does not appear to be any ground for believing that in the Government Institutions Scientific Instruction is provided at a lower rate than in these Colleges. It is rather with regard to the competition for professors, than with regard to the competition for



students, that the disadvantage is alleged to exist, it being obviously difficult to maintain an unendowed and self-supporting system of instruction at the same level of efficiency as one assisted by public funds, or endowments. We have already referred to the complaint on the part of University College, that "able professors are drawn away from it by "opportunities of obtaining better remunerated posts," and that in this way it suffers directly from an unequal competition with the State. To the same effect the Principal of King's College observes, "It is clear that the Government comes into the field with "the advantage of the public purse, and can pay their teaching staff very far better "than we can pretend to do; the effect ought to be that they should draw the best "teachers to their College by being able to remunerate them most largely. If they get "the best men, their tuition ought to be the best, and if their tuition is the best, of "course they will gain the greatest amount of success. I say it ought to be so, "because other than pecuniary influences come in." It must, however, be admitted that the Schedules of the Professorial stipends at the Royal School of Mines, and at Cooper's Hill College, which will be found in the Appendix to this Report, do not altogether justify the apprehensions which have been expressed to us by the witnesses from University and King's Colleges.

Qu. 7136.

Qu. 7103.

App. VI.,  
p. 38.

38. These witnesses further agree in entertaining the apprehension that there may be a tendency in the distribution of Government patronage to prefer students educated at Government Institutions to students educated at independent Colleges. At the time of the first establishment by the Government of the Engineering College at Cooper's Hill, it was in contemplation that appointments in the Indian Engineering Service should be confined to the students trained in that College. As the Council of King's College felt that this restriction was likely to exercise a most depressing influence on their own Engineering School, they addressed a Memorial to the India Office on the subject; and a similar Memorial was also presented by the Council and Senate of University College. The cause of complaint was, however, in great measure removed by the determination at which the Government ultimately arrived, in accordance with a resolution of the House of Commons, to allow students from other Colleges to compete, under certain conditions, for admission to the Engineering Service of India. This after action of the Government may be taken as a sufficient proof that the independent Colleges are in a position to assert successfully the claims of their own students to a fair share in the distribution of Government patronage. We have, however, thought it our duty to refer to the matter, as our attention has been called to it in the evidence, and as some importance has been attached to it by the working staff of the two Colleges.

39. The question of applying to Government for pecuniary assistance appears to have come under the notice of the authorities both of University and King's Colleges; but no formal step with this object has been taken by the Council of either Body. Speaking on behalf of University College, Mr. Robson says, "The question has been discussed "several times in the Senate or body of Professors, but the Council hitherto have never "discussed it in a formal manner. I speak with some amount of hesitation and reserve, "but I believe that the general feeling in the Council, at all events until very recently, "was that if they could maintain the Institution without making any appeal to the "Government or to Parliament, they would very much prefer doing so. I think it "may be truly said that every effort has been tried to accomplish that end. The "financial statement which I have read shows that the Council have gone on from the "first with a determination to carry on the Institution without appealing to the public, "if possible; and probably if it had not been for the recent very great extension of "scientific teaching in every department all over the country, they might have continued to pursue the same policy; but it is quite clear, I think, that our means and "appliances, although they might have been sufficient 20 or 30 years ago, are not "sufficient now; and undoubtedly the resources of the Institution have not increased "of late."

Qu. 7135.

40. The witnesses from King's College speak with more definiteness. Mr. Cunningham states that the history of the College has, in his judgment, established its claim to public support, and bases that claim mainly on the following grounds: "First "of all, the very large educational work on which we are engaged. . . . .  
"Secondly, the immense difficulty of carrying it on with such very small funds as we "possess. Thirdly, the new wants every day coming up which we really cannot meet. "Lastly, the very large number of honours gained at the Universities by the students "of King's College."

Qu. 7058.

### Recommendations with reference to the two Metropolitan Colleges.

41. After carefully reviewing the evidence laid before us with regard to University and King's Colleges, and especially taking into account the great public services which have been rendered by these two Institutions to Scientific Education in the Metropolis, we are of opinion that, subject to the reservations which we shall make hereafter, they have established a claim to the aid of Government which ought to be admitted. We think that such Government aid should be afforded, both in the form of a capital sum to enable the Colleges to extend their buildings where requisite, and to provide the additional appliances for teaching which the advance of scientific education has now rendered absolutely necessary; and also in the form of an annual grant in aid of the ordinary working expenses of the Colleges.

42. With regard to the grant of a capital sum we are of opinion that it should be appropriated to definite objects such as those above referred to; and we further think that the amount of such grants should be dependent upon the amounts raised by subscription.

43. With regard to the annual grants in aid of the income of the Colleges, we think that they also should be appropriated to definite purposes, such, for instance, as the augmentation of the stipends of certain professorships, the payment of demonstrators and assistants, or payments in aid of the laboratory and establishment expenses. An account of the yearly expenditure of each Institution receiving such assistance should be reported to Government. As the suspension or withdrawal of the annual grant would always remain in the power of Parliament, we do not think that it would be necessary or desirable to give the Crown a voice in the appointment of the professors, or any control over the management of the Colleges, other than such visitatorial jurisdiction as would be implied by an annual presentation of the accounts.

44. As we do not consider that a day school in the metropolis ought to receive pecuniary assistance from an Institution which is itself in receipt of such assistance from Government, our recommendation of Government aid to University College is subject to the reservation that its financial arrangements shall be such as, while enabling the College to do full justice to the School, may prevent the School from becoming a charge upon the funds of the College on an average of years. Our recommendation is also subject to the reservation that the finances of the Hospital, and of the purely Medical Departments, shall be kept distinct from those of the College generally. Our inquiry has not extended to Medical Schools, and it is not within our province to make any recommendation with respect to Government aid to such Schools, whether associated with Scientific Colleges or not. In the case of University College, where such an association exists, we think it expedient that the annual outlay on the purely Medical Department should be kept distinct, in order to enable the Government to consider separately the question of aid to the Scientific Department. At the same time, we do not think that there is any reason why the boys' School and the Hospital should not continue, as at present, under the management and control of the Council of the College.

45. The same reservations apply to our recommendations with regard to King's College. Indeed, so far as King's College Hospital, and the Medical School connected with it, are concerned, the need of such a reservation is more obvious, because it is admitted that these institutions are a heavy burden upon the resources of the College.

46. With regard to King's College, we would further suggest that the College should apply for a new Charter, or for an Act of Parliament, with the view of cancelling the proprietary rights of its shareholders, and of abolishing all Religious Restrictions (so far as any such exist) on the Selection of Professors of Science, and on the Privileges extended to Students of Science. We consider that any grant of public money which may be made to King's College should be conditional on such a reconstitution of the College as should effect these objects. And we suggest that advantage might be taken of the opportunity thus afforded to introduce into the government of the College such other modifications as the experience of the persons concerned in its management may have shown to be desirable.



## II. THE OWENS COLLEGE, MANCHESTER.

47. This College owes its origin to the bequest of a merchant of Manchester, Mr. John Owens, who in 1846 bequeathed the principal part of his property to Trustees, whom he appointed in his will, to found within the limits of the Parliamentary Borough of Manchester, or within two miles of its boundary, "An institution for providing or " aiding the means of instructing or improving young persons of the male sex—and " being of an age not less than fourteen years—in such branches of learning and science " as were then and might be thereafter usually taught in the English Universities." The original Trustees were either personal representatives of Mr. Owens or officially designated; and the government of the College was for many years in the hands of fourteen Trustees appointed under the will of the Founder; the work of instruction, the maintenance of discipline, and the ordinary executive, subject to the general control of the Trustees, having been during this period entrusted to the Principal and Professors, at first six and afterwards nine in number.

See Minutes of Evidence. Statement B. Owens College Extension, Vol. I., p. 481.

48. Before proceeding to open the College the Trustees made very extensive inquiries as to the course which they ought to pursue and as to the subjects of study, consequently the College was not opened until 1851. They had no power to spend any portion of the original endowment in the purchase of land or erection of buildings, but having first hired a house and land in Quay Street, they were relieved from immediate difficulty by Mr. George Faulkner, who purchased these premises for 4,500*l.*, and presented them to the College. This building in the progress of the College was found to be quite inadequate and inconvenient, though "an auxiliary fund" had been raised, a portion of which, amounting to about 4,300*l.*, had been expended in the erection and fitting up of a chemical laboratory, and in building and fitting up class rooms.

49. It may be convenient to state what were the original resources derived from the bequest of Mr. Owens, and what have been the subsequent accumulations; though, in doing so, the history of the College in its scholastic relations will necessarily be somewhat anticipated.

50. The endowment of the founder consisted of 91,325*l.* 3*s.* 4*d.*, and the gross income arising from it amounted in 1871 to 3,197*l.* 1*s.* 5*d.* In the history of the College since its opening in 1851 numerous proofs have been given of the interest taken by the inhabitants of Manchester and the neighbourhood in its success, as will appear from the following list of benefactions :—

Vol. I., p. 477.

Vol. I., p. 481. Statement B. Owens College Extension.

The Auxiliary Fund, consisting of donations from 118 merchants and others, made about the year 1852, for the erection of a chemical laboratory, the formation of a library, and generally in aid of Mr. Owens' bequest		£9,610
Land and buildings, the gift of the late Geo. Faulkner, Esq., originally valued at		4,500
The Victoria Scholarship (Classics)		500
The Wellington Scholarship (Greek Testament)		500
The Dalton Memorial Fund for Scholarships in Mathematics, Chemistry, and Natural History		4,125
The Shuttleworth Scholarship (Political Economy)		1,250
The Shakespeare Memorial Fund for a Scholarship in the English Language and Literature		1,071
The Cobden Memorial Fund for the further endowment of the chair of Political Economy, and for prizes		1,966
The Grammar School Scholarship		1,060
		<u>£24,582</u>

Recently a further sum of 10,000*l.* was bequeathed by Mr. Langworthy, and will soon be available.

Minutes,  
Vol. I.  
p. 482.

51. In 1867 an important movement originated for the extension of the College. The classes had become more numerous; the number of the students had increased; the College had been affiliated to the University of London, and 130 of its students had matriculated in that University, one half of whom had proceeded to the higher examinations for degrees. Probably no institution of the kind at that time conducted the instruction of its students in so confined a space. It was apprehended that unless ampler and more appropriate accommodation could be provided, the prosperity of the College would suffer a decline as steady as its growth had been till that time; it was therefore determined to raise a fund for the erection of new buildings. The promoters organised themselves into an Extension Fund Committee, with the view of furnishing "the highest general education leading to degrees in Arts and Science, and the special training required for professional and mercantile life." They proposed to found various new professorships, and to provide them "with all the apparatus for complete and successful study; to set aside considerable sums for the extension and regular maintenance of the Library and of the Physical and Natural History Department; and, above all, to place the Chemical Department in a position of efficiency worthy of the present state of the science, and of its importance in relation to the interests of this district." The consequences of this movement were not confined to the amount of the contributions obtained for the general fund. It was accompanied by subscriptions towards special objects, such as the establishment of a fund to endow a chair of Civil and Mechanical Engineering, and the building of a Chemical Laboratory; and by the gravitation to the College of the buildings and collections of the Natural History and Geological Societies; and, more recently by the absorption of the Manchester Medical School into the scheme of the College.

52. The amounts subscribed may be classified as follows:—

*A. For Land and Buildings.*

General fund	-	-	-	-	-	£83,000
Subscriptions, Laboratory	-	-	-	-	-	3,500
Subscriptions — Medical School — including one-half of Miss Brakenbury's gift	-	-	-	-	-	10,300
Realised value of old buildings in Quay Street	-	-	-	-	-	13,000
						<hr/> 109,800
Part of estimated value of building and site transferred by the Natural History Society, available for contemplated Museum only						5,000
						<hr/> £114,800

*B. For Endowment.*

General and specific endowments including Mr. Langworthy's bequest	27,000
Endowment for Chair of Civil and Mechanical Engineering	13,500
Residue of value of the Natural History Society's property (for Natural History only)	8,000
Medical School endowment—other half of Miss Brakenbury's gift	5,000
	<hr/> 53,500
Total	<hr/> £168,300

53. The Land and Building Fund has been in part expended in the following manner. A site of about four acres has been acquired at a cost of 31,000*l.* and a part of the College buildings has been erected, upon plans prepared by Mr. Waterhouse, at a cost of 54,000*l.*, to which must be added an estimated outlay of 15,000*l.* for internal fittings. These buildings, now completed, contain (1) lecture rooms of various sizes for the Classical, Mathematical, English, and other Arts Departments; (2) lecture rooms, laboratory, workshops, drawing room, and museum, for the Natural Philosophy and Engineering Departments; (3) lecture rooms for the Natural History and Geological Departments, and temporary accommodation for the Natural History Museum; and (4) temporary library, room for examinations, Governors' council room, private rooms for the Principal and Professors, Registrar's room, Students' common room, and Offices. The new College Buildings also include a large and complete Chemical Laboratory, containing provision for upwards of 100 students, together with a Lecture Theatre capable of holding 400 persons, which will be generally appropriated to the Chemical Classes.

54. The buildings for the Medical School are also in course of erection, at an estimated cost, including internal fittings, of 15,000*l*.

55. The whole immediate outlay, already incurred or under contract, for buildings App. III. and land is estimated at 131,934*l*. Towards this outlay the Extension Fund Committee report that (including the realised value of the old site and buildings, and the Brakenbury bequest) they have available the sum of 109,885*l*., leaving an immediate deficit of 22,049*l*.

56. Other buildings comprised in Mr. Waterhouse's plans, and required for the Museum, Library, and Hall, but not yet erected, the Committee estimate will cause a further expenditure, within a few years, of 60,000*l*., towards which outlay there is in hand 5,000*l*., derived from the Natural History Society's building fund. There is therefore on these proposed future extensions a deficit of 55,000*l*.; so that, in order to carry out the intentions of the Court and Council of the College, a further sum of 60,200*l*. will be required for building.

57. In the original organization of the College, the Trustees felt themselves under an obligation to introduce at once into the curriculum all the subjects of a liberal education, "that is to say, Classics and Mathematics pure and applied, Logic and " Mental and Moral Philosophy, History, English and Modern Languages;" but whereas Natural Philosophy was at that time treated as a branch of Mathematics, and Chemistry was regarded in the light of a Chair of the second and not of the first rank, in the course of about 10 years a great change had to be made in order to give to the practical departments of Experimental Science, and especially to Chemistry, their proper position in the curriculum. The Chairs which Principal Greenwood, who is also Professor of Greek, reports to have been established (31st March 1871), and the fixed salaries paid to the Principal, the Professors, and Assistant Lecturers are shown in the following table. Although our inquiry only extends to Owens College regarded as a Scientific Institution we give the statistical facts relating to the Classical and Literary Professorships, because in the case of this College these professorships are partly remunerated by fixed stipends, and we desire to show the total charge upon the income of the College.

Qu. 7253.

See Minutes  
of Evidence,  
Vol. I,  
p. 478.

PRINCIPAL - - - - £700.

<i>Arts.</i>	<i>Professors.</i>	<i>Science.</i>	
Professor of Greek - -	£350	Professor of Mathematics (half) -	£175
" Latin - -	250	Senior Professor of Natural Philosophy, and Director of Physical Laboratory - -	400
" English Language and Literature and of Ancient and Modern History - -	300	Junior Professor of Natural Philosophy - -	150
Professor of Mathematics (half) -	175	Professor of Civil and Mechanical Engineering - -	300
" Logic and Mental and Moral Philosophy and of Political Economy - -	250	Professor of Chemistry - -	150
" Jurisprudence and Law - -	120	" Natural History - -	250
Professor of Oriental and Modern Languages - -	100	Lecturer in Geology - -	140
Lecturer in French (paid by fees only).			
	<u>£1,545</u>		<u>£1,565</u>

<i>Arts.</i>	<i>Assistant Lecturers.</i>	<i>Science.</i>	
Classics - -	£150	Mathematics (transferred to Arts for evening lectures -	£125
English Language and History -	150	Natural Philosophy - -	100
Mathematics - -	125	Engineering - -	120
		Chemistry, Senior Assistant -	200
		" Junior " -	200
	<u>£425</u>		<u>£745</u>
Total -	<u>£1,970</u>	Total -	<u>£2,310</u>



The following Table contains the proportion of fees paid to the Professors and Lecturers in addition to the above fixed stipends.

SHARE of FEES paid to Professors and Lecturers, 1872-3.

I.— <i>In the Day Classes.</i>				£	s.	d.
Professor of Greek	-	-	-	180	2	6
"    Latin	-	-	-	233	13	6
"    English and History	-	-	-	314	5	6
"    Mathematics	-	-	-	301	5	0
"    Logic, Political Economy, and Philosophy	-	-	-	39	4	4
"    Jurisprudence and Law	-	-	-	59	6	0
"    Modern Languages (German)	-	-	-	93	10	6
Lectures in French	-	-	-	190	11	6
Professors of Natural Philosophy (two)	-	-	-	297	3	11
Professor of Engineering	-	-	-	109	8	0
"    Chemistry	-	-	-	1,213	6	6
"    Natural History	-	-	-	52	3	2
Lecturer in Geology	-	-	-	37	14	5
"    Free hand Drawing	-	-	-	16	16	0
"    Mineralogy	-	-	-	6	6	0
"    Organic Chemistry	-	-	-	54	12	0
				£3,199	8	10

II.—*In the Evening Classes.*

	£	s.	d.
Lecturers in Classics (three)	100	10	0
"    English and History (three)	59	16	3
"    Mathematics (three)	42	0	0
"    Logic and Political Economy (two)	28	0	0
"    Natural Philosophy (two)	28	10	0
"    Chemistry (two)	128	13	3
Lecturer in German	39	7	6
"    French	80	0	0
"    Engineering	26	13	6
"    Geology	11	5	0
"    Harmony	23	2	6
£567 18 0			
3,199 8 10			
567 18 0			
Total	£3,767	6	10

58. In addition to the Professorships enumerated in the first Table, the Chairs of Practical Physiology and Systematic Physiology in the School of Medicine have since become available to the Students of the College.

59. The following are the sources of income out of which the College defrays its general expenditure and the fixed stipends and other emoluments of the several Professors and Lecturers (not including the Medical Department):—

Original endowment	-	-	-	£3,182	0	0
New general endowment fund	-	-	-	550	0	0
Transient rentals, temporary endowments, and other miscellaneous sources	-	-	-	1,640	0	0
Cobden Fund	-	-	-	60	0	0
Ashbury Fund—Engineering	-	-	-	188	0	0
Engineering Professorship Fund	-	-	-	388	0	0
Geological Professorship Fund	-	-	-	105	0	0
Law Professorship Fund	-	-	-	63	0	0
				£6,176	0	0
Fees received from Students, 1872-3	-	-	-	5,289	0	0
Total	-	-	-	£11,465	0	0

This income (1872-3) was expended in the following manner, viz. :—

The fixed salaries of Professors and Lecturers -	-	£4,940	0	0
Share of fees appropriated to Professors and Lecturers -	-	3,767	0	0
Departmental expenses, including Library -	-	1,248	0	0
Establishment expenses, including rates, taxes, water, gas, wages, &c. -	-	1,432	0	0
		£11,387. 0 0		

60. It will be seen from the above financial statements that some of the professorships are inadequately paid. Thus, though the Chair of Latin has been separated from that of Greek, it has not been found possible to provide a full stipend for the new Chair. And though the Natural History Chair has been divided, its Professor being now charged with lecturing on Animal Physiology and Botany, the Chair of Geology has been assigned, not to a professor, but to a Lecturer with a very inadequate stipend. The Lecturer in Mineralogy, though a well-trained and skilful Mineralogist, receives practically neither stipend nor fees.

The financial statement also shows that with the present resources of the College, it is impossible, however much the Governors may desire it, to provide a more adequate remuneration for the Chairs in question.

61. It is also certain that the new buildings will involve a very considerable increase in the establishment expenses, and that some of the temporary sources of income enumerated in paragraph 59 will fail. The annual deficit which may thus arise is estimated at about 1,500*l*.

62. With the prospect of this deficiency the Governors of the College cannot at present undertake the establishment of any new Chairs. If, however, they had adequate resources, it has been stated that they would probably proceed to divide the Professorship of English and History, and to found new Chairs of Mixed Mathematics, of Applied Geology and Mining, of Astronomy and Meteorology, and of Architecture.

63. We have already stated that the estimated cost of the buildings of the Medical School, which are now in course of erection, and which will probably be completed in October next, amounts to 15,000*l*., towards which, as we have shown, a special fund of 10,300*l*. has been given. It is intended that after the completion of the buildings, the expenses of the Medical School shall be covered by separate endowment, so that the union of the School to the College will not entail any burthen on the latter.

64. The following table shows the number of students attending the various Day Classes :—

Day Classes.	1872-3.	1873-4.
Total number of students -	337	356
Average number of classes attended by each student.	4.78	4.6
Entries to the classes of :—		
Greek - - -	128	129
Latin - - -	152	162
English Language and Literature -	156	165
History - - -	134	118
Mathematics - - -	169	165
Natural Philosophy - - -	169	170
Engineering - - -	66	81
Logic and Political Economy -	25	42
Jurisprudence - - -	49	52
Chemistry - - -	309	312
		besides
Mineralogy - - -	7	31 medical.
Botany - - -		6
Zoology } Natural History -	41	58
Geology } -		besides
		29 medical.
Practical Physiology - -	"	1
		besides
		54 medical.
French - - -	128	98
German - - -	60	42
Hebrew - - -	10	9
Freehand Drawing - - -	10	12
Harmony - - -	"	14
	1,613	1,636



The number of students in the Medical School is 140. These have not been included in the above table.

65. The ages of the students attending the day classes are shown in the following table, which, with the former, has been furnished to us by Principal Greenwood :—

—	Under 16.	16-18.	18-20.	Above 20.	Total.
1871-2	41	99	69	118	327
1872-3	34	121	75	107	337
1873-4	37	117	75	127	356

66. The evening classes, which were originally established in 1852-3, form an interesting feature of the College. In the first two years instruction was given in Classics and Mathematics only, the classes being then intended for the use of schoolmasters alone; and these subjects being the most desirable for them. Only 28 students attended in the first year; but, after a few years, the classes were thrown open to all applicants, by the absorption of an institution called the "Working Men's College," conducted by the Professors of Owens College and other gentlemen in Manchester. The range of subjects taught has been gradually enlarged so as to include the whole of those comprehended in the day classes; and the fees have been reduced so as to bring the instruction within the means of a larger number. In order to provide some additional remuneration for the teachers of each class, 500*l.* a year is contributed by two friends of the College, Mr. Henry B. Jackson and Mr. Samuel Watts. This subscription secures 10*l.* per annum to the lecturer in each class, as well as the offer of an exhibition of 2*l.* 10*s.* 0*d.* to the most successful student in each class, and of other exhibitions ranging from 2*l.* 10*s.* 0*d.* to 10*l.* 0*s.* 0*d.*, on graduation in the London University, according to the rank taken by the candidate. These arrangements have been followed by remarkable success. The number of students entering during the last two years, and the average number of entries in each class, are shown in the following table :—

Evening Classes.	1872-3.	1873-4.
Total number of students	557 individual students.	889 individual students.
Average number of classes attended by each student	1.58	1.76
Entries to classes of—		
Greek	88	90
Latin	83	151
English and History	94	182
Mathematics	105	168
Natural Philosophy	41	123
Engineering	41	101
Logic and Political Economy	94	114
Chemistry	89	177
Natural History	18	56
French	128	239
German	63	110
Harmony	37	50
Total entries to different classes	881	1,561

67. We have had evidence from the Principal of Owens College, who is also the Professor of Greek, and from Dr. Roscoe, the Professor of Chemistry, on the beneficial reciprocal influence of literary and scientific studies in the courses pursued by the students. Thus Principal Greenwood says :—"Our regular courses are directly fashioned to meet the requirements of the London University degrees; and as the London University demands of all those who seek its degrees, whether in Arts or in Science, or in Law, or even in Medicine, that they must first of all matriculate, every holder of a degree in the University of London must needs at one stage of his preparation for the degree have gone through a preliminary culture both in Science and Literature. Thus a Bachelor of Science must have shown himself possessed of the minimum of Classics, and a Bachelor of Arts or Laws of the minimum of Science. Therefore in this way our own conclusions are materially aided by the line taken by the London University."

68. These conclusions are expressed in the following terms by Principal Greenwood :—"Not only do men of science undergo a useful influence from the co-existence in the same College of language studies, but for another reason they should desire this

Qu. 7257.

Qu. 7254.

“combination.” “The influence of the introduction of experimental Science into our regular curriculum, not merely on those students who are going into some scientific profession, but also on the ordinary students, has been of the most beneficial kind.”

69. The course adopted by the Science students is thus described by Professor Roscoe:—“We lay down a distinct course of study in Science adapted especially for the Science degrees of the London University, with which, as has been stated, we work. In the first year the course in Science and Literature is identical, being the preparation for the London University Matriculation. In the second year the Science course consists of Mathematics, Natural Philosophy, Mechanics and Physics, the junior class of Chemistry and laboratory practice two days a week, Anatomy and Physiology, together with French or German. I have all along insisted very strongly on the necessity of introducing the study of these two modern languages in connexion with our Science course. In the third year the Science students take the following subjects: Logic, Mental and Moral Philosophy, Mathematics, Mathematical Natural Philosophy, the senior class in Chemistry, laboratory practice two days a week, Geology, and Botany.” The prescribed courses in Science and in Engineering (as in Arts) are not obligatory; and a majority of students in all departments, except Engineering, take courses varying more or less from those laid down. In the present session the number of students following these courses is in Science 27, and in Engineering 22. Thus of a total of nearly 200 students who may collectively be described rather as students in Science than in Arts, only 49, or about one in four, are following the prescribed course. The least departure, however, from the curriculum causes them to be classed as *occasional* and not as *regular* students; but a majority of them are really as thorough students as the 49.

Vol. I,  
p. 497.  
Qu. 7364.

70. In the Science Course, the fees for the first year are 15 guineas, and for the second and third years 22 guineas each. We take the following comparison between the cost of Science and Art students from Principal Greenwood's evidence:—“Each Science student costs the endowment 27*l.* 15*s.* and each Arts student, or non-science student, costs the endowment 11*l.* 13*s.*, and that although, from the nature of the case, the fees paid by the Science men are much heavier than those paid by the non-science men. Every Science student on the average pays 17*l.* 10*s.*, and every Arts student pays 9*l.* 7*s.*; so that while the Science men pay on the average twice as much as the non-science men, they yet cause a net expenditure to the endowment of 27*l.* 15*s.*, against a net expenditure of 11*l.* 13*s.* in the other case. Of course the addition of the two sums will give about 45*l.* as the gross cost of each Science man, against, in the other case, about 20*l.*”

Vol. I,  
p. 479.  
Qu. 7259.

71. As the course of instruction is intended to meet the requirements of the London University, it is interesting to ascertain how many students have recently matriculated in each year, and how many of these have proceeded to take degrees in that University. We have therefore procured the following return from the Principal:—

—	Matriculation.	1st B.A. (not held till 1859).	2nd B.A. (including B.A. up to 1859).	M.A.	1st B.Sc. including Prel. Sc. (M.B.) (instituted in 1860).	2nd B.Sc.	D.Sc.	1st LL.B. (instituted in 1866).	2nd LL.B.	LL.D.
1851 to 1867.	125	26	42	5	25	7	1	—	3	1
1868 -	10	1	4	—	5	2	—	—	—	—
1869 -	7	1	2	—	3	—	—	—	—	—
1870 -	6	1	4	1	1	1	3	—	—	—
1871 -	21	2	1	1	5	—	—	—	—	—
1872 -	20	9	6	—	10	3	—	2	—	—
1873 -	34	7	6	2	13	5	—	—	—	—
1874, Jan.	3	—	—	—	—	—	—	—	—	—
Totals -	226	47	65	9	62	18	4	2	3	1



72. This summary of the principal characteristics and of the history of Owens College would be incomplete without an account of the arrangements made for incorporating the results of the efforts of the Extension Fund Committee with the institution founded by the original Trustees. This Committee was instructed to proceed, in conjunction with Mr. Owens' Trustees, to make application to Parliament for an Act or Acts for the incorporation of the Governors under the extension scheme, so as to enable the Trustees of the Owens College to unite that Foundation with the Institutions which might result from the exertions of the new body. The requisite Acts of Parliament have since been passed, and in virtue of them the College received a new Constitution on the 1st of September 1871.

73. The Constitution thus conferred may be briefly described as follows:—The essential conditions of Mr. Owens' will are embodied in the Acts; but the age below which the College is not bound to admit students is raised from 14 to 15 years; "and the restriction of Mr. Owens' will as to the sex of students may, subject to certain qualifications, be set aside at the discretion of the Governors." In lieu of a body of Trustees renewable by private co-optation, the Act provides for the appointment of a body of 42 Governors, 24 to be selected from gentlemen residing within 50 miles of Manchester, and 15 to be nominated, so as to secure a definite and characteristic but a somewhat wider rerepresentation of public interests. It is provided that three shall be nominated by the President of the College, three by the Lord President of Her Majesty's Privy Council, or other Minister of Education, and three by the Governors themselves from amongst the Members of Parliament for the counties and boroughs of Lancashire, Cheshire, Yorkshire, and Derbyshire; two by the Council of the city of Manchester, and one by that of the borough of Salford. With the object of introducing into the Governing Body distinguished alumni of the Institution, the nomination of three Governors is intrusted to the Associates of the College. The Principal of the College and two Professors, to be elected by the body of Professors, complete the number.

The 42 Governors elect a President, and with him form, as the Court, the supreme Governing Body.

The Court appoint out of the Governors a Treasurer and 10 members of Council, who, with the Principal and two Professors, form the Council, or the Executive Committee of the College. The Principal and Professors form the Senate of the College.

The Council, subject to the control of the Court, conducts the whole of the ordinary, so to speak, secular business, and the external relations of the institution; and the Senate, subject to the control of the Council, the whole of its internal or academic business. The President is the Official Head of the Court, the Treasurer of the Council, and the Principal of the Senate.

74. The Owens College has now been twenty-three years in operation, and we have briefly traced the principal stages of its development. It has acquired considerable reputation, and has a staff of twelve Professors, without including those of the Medical School, many of them distinguished in Arts or Science. The income from endowments and fees is about 11,500*l.* a year. Its lectures are attended by more than 350 students, exclusive of the Medical School, and of the evening classes which are attended by nearly 900 persons. The whole capital accumulated in its foundation, including the original bequest of Mr. Owens, exceeds a quarter of a million sterling, and is of purely local origin, being derived from public subscriptions, from benefactions, and from the amalgamation of local institutions owing their origin solely to private contributions. Its government has the character of a public trust; and the large capital embarked in it, together with the Acts of Parliament by which its constitution is defined, affords sufficient guarantee for the maintenance of the principle of its foundation, and of the character of its administration. It is placed in the midst of a population already possessing many secondary schools, some of which are in a state of growing efficiency, and capable, therefore, of supplying students prepared to pursue the courses of education which it provides. These advantages are offered to the entire population without distinction of class, and without any religious disqualification. The entire scheme of the College has not yet been carried into effect. The Extension Fund Committee report that a further sum of 60,200*l.* is required for the completion of the buildings. It is also estimated that 3,000*l.* a year in addition to the present income is needed for the support of the Chairs now existing or imperatively required.

### Recommendation.

75. Considering the strenuous and persevering efforts made by the great commercial community by which the Owens College is surrounded, and the cordial sympathy which these efforts have evoked, and which has manifested itself in the incorporation of other Societies and Schools with the College, and in the subscriptions and benefactions for special objects by which the exertions of the Governing Body have been seconded; We are of opinion that this Institution has established a claim to aid from the National Funds. We, therefore, recommend, in accordance with the views which we have expressed with regard to the two Metropolitan Colleges, that the Owens College should receive assistance from Government, both in the form of a capital sum, to be regarded as a contribution towards its Building Fund, and also in the form of an Annual Grant, in aid of its working expenses, with the especial view of enabling it to complete the curriculum of studies by the establishment of New Chairs.

### III.—THE COLLEGE OF PHYSICAL SCIENCE, NEWCASTLE-UPON-TYNE.

See Appendix IV.

76. The University of Durham is provided with Professorships of Mathematics and Astronomy, and with a Readership in Natural Philosophy. It also possesses a Museum of Natural History, and an Astronomical Observatory. It is in intimate connexion with the Medical School at Newcastle-on-Tyne, and is thus in a position to give a complete system of instruction in Medicine, and to grant degrees in that Faculty. The University further confers a certain academical *status* on Mining or Civil Engineers who reside for three Terms, and pass two Public Examinations. But as this University cannot be said to have any complete Scientific Faculty, or to offer any complete System of Instruction, or of Examinations in Science, we have not thought it our duty to take any evidence with regard to the older foundations connected with it, but have confined our attention to the efforts which it has recently made to advance Scientific Instruction by assisting in the establishment of a College of Science at Newcastle-upon-Tyne.

77. This College was founded in 1871 for the teaching of Physical Science, particularly in its practical application to Engineering, Mining, Manufactures, and Agriculture. The funds necessary for its endowment were provided in part by the University of Durham, which gave in the first instance 1,000*l.* a year in perpetuity, which has since been increased; and, in part, by a subscription raised in the north of England.

Qu. 8757.

78. The circumstances which led to the foundation of the College are stated in the evidence of the Dean of Durham. It appears to have been felt that the instruction afforded by the University of Durham did not completely meet the educational wants of the north, and that the chief reason which had originally led to the Foundation of that University, namely, the expectation that it would attract a large number of students from among the people of the north country, had almost entirely ceased to exist. Under these circumstances, it was thought that to render the University more generally useful the best step that could be taken would be to establish a School of Physical Science in connexion with it. The question then arose, what would be the proper place at which to found this school. Opinions were to a certain degree divided as to whether it should be placed at Durham itself, or at Newcastle; but it was found that almost all the eminent employers of labour were strongly in favour of Newcastle upon a variety of grounds.

79. We have also received the following statement from the Dean of Durham as to the amounts contributed from local sources (in addition to the endowment given by the University of Durham), and as to the arrangements which are now in contemplation for amalgamating with the College the other Scientific Institutions in Newcastle:—

Appendix IV.

“ 1. Sums equivalent to 30,000*l.* have been paid or guaranteed to the College of Science.

“ 2. A subscription has lately been raised to found a Memorial to the late Mr. Albany Hancock, and the sum promised amounts to 17,000*l.* It is proposed to devote this sum to a building for a Museum to form part of a larger building for a College of Physical Science.

“ The sum thus subscribed would, if added to that already subscribed to the College of Science, amount to about 50,000*l.*; and it may be proper also to mention that the value of the Museum itself and of its permanent building amounts to at least 10,000*l.*

“ In addition to this the Medical College of Newcastle is desirous to join in the erection of a Joint College, and will subscribe the sum of 10,000*l.* for the purpose.”

80. The amount originally subscribed was of course insufficient to provide buildings for the new institution, and the College has at present to pay rent for the premises which it occupies. It is the opinion of the witnesses that it is extremely desirable that the College should be provided with buildings of its own. Mr. Lowthian Bell says, that “ the buildings are very good, but they are deficient in laboratory accommodation. I should greatly prefer a building expressly erected for the purpose of the College.” Sir William Armstrong adds: “ We consider the present accommodation as a makeshift, but without Government assistance it would be scarcely possible to undertake” to provide separate buildings appropriated solely to the College.

Qu. 9193.

81. The College is under the government of a Body consisting of 47 members, of whom nine are *ex-officio*, and the remaining 38 are elected for a term of four years by various representative bodies. These Governors elect out of their own number a



Council consisting of 15 members, in whose hands the ordinary administration of the College is placed. It was proposed in the first instance to provide four Professorships, viz., of Pure and Applied Mathematics, of Chemistry, of Experimental Physics, and of Geology. To these Professorships lectureships have been added in literary subjects, in Greek and Latin, in English History and Literature, in French, and in German, besides a lectureship in Mechanical Drawing. It is thought very desirable by the Founders of the College that other Professorships of Science should be added to those already founded. Mr. Lowthian Bell, speaking immediately before the foundation of the College, expresses the opinion of its promoters, "We are quite unanimous upon the branches of knowledge which we ought in the first instance to undertake . . . Pure and Applied Mathematics, Chemistry, Geology, Mineralogy, and Physics. We are quite unanimous upon these as a commencement, and we are also unanimous, I think, that as soon as the College has the means, we should have other chairs; for example, a chair of Biology, and a chair of Mining, and Civil Engineering. I have no doubt that these will follow." Of these we observe that the Professorship of Biology has already been established and is on the point of being filled up. Qu. 9153

82. The number of students in the year 1873-4 was 78. An account of the number of students attending the various classes during this session will be found in the Appendix. The course of study for regular students is one of two years, and there are two examinations, one at the end of each year, besides a Matriculation Examination at entrance, for which, however, any examination recognised as a qualification for registration as a Student of Medicine, is accepted as a substitute. The candidates who pass the Final Examination in Physical Science at the end of the second year receive the title of Associate in Science of the University of Durham; but not the B.A. degree. The fees paid by the students are five guineas a year for each course of lectures, the fee for admission to the College being one guinea, and a separate charge being made for the use of the laboratory. Four Exhibitions of 15*l.* a year, tenable for two years by Students at the College, are offered for public competition every year. Appendix IV.

83. There appears to be every reason to think that the Newcastle College of Science is serving a most useful purpose in its own neighbourhood. The experiment of introducing an engineering course into the curriculum of the University of Durham has been tried, and must be considered to have failed. The reason given for this failure by the Dean of Durham is that a great number of young men who would wish to attend that course live in Newcastle, or near Newcastle, and have to come some distance to Durham, and that consequently very few of them do come. And there can be no doubt that local Colleges in the great centres of manufacturing industry are in a position to meet local requirements which Central Institutions in London, or the National Universities are unable to do. Sir William Armstrong says, "I think what we want is local Colleges. London is far too distant. We want a College to be established in the locality, so that young men can attend it without going from their homes. I do not think that a College in London would have any practical effect in realizing the object that we have in view." "If local Colleges were as efficient as central ones, there is no question that they would be preferred by all classes." Qu. 8778. Qu. 9218. Qu. 9220. Qu. 9222.

84. According to the same witness, the character of the instruction should be mainly, or almost entirely, of a purely scientific character, because at present there is no difficulty as regards practical knowledge, while on the other hand there is no means of acquiring scientific knowledge. Sir William Armstrong does not think that practical instruction should be combined with scientific instruction in the College itself, because "practical knowledge is better acquired in the workshop and in offices, in actual business in fact." He would not attach any workshop to the College, believing that what the College can give is "the facility of acquiring theoretical information, such as can be applied to practice in actual business." Qu. 9223. Qu. 9224. Qu. 9225.

85. The claims which the promoters of the College consider themselves to have upon the Government for assistance are founded upon the National usefulness of the Institution, and on the amount of local support which it has received. Sir William Armstrong's view is that the promoters "have a very sound claim upon the Government, considering how liberally the scheme has been supported locally. I think it would be a very fair thing if the Government, considering how much the nation benefits from the establishment of such Colleges, in every case were to contribute a sum proportional to what has been raised in the locality towards the attainment of the object." And Mr. Lowthian Bell states that, in his opinion, "It is essential for the progress of the industry of this country, looking at the footing upon which it is placed now, that those to whom is entrusted the management of large concerns Qu. 9213. Qu. 9152.

“ should have generally a higher class of education than that which they possess  
 “ at the present time. At the same time, I am bound to say that very great progress  
 “ has been made by many in spite of their want of instruction upon those questions  
 Qu. 9157. “ which, in my opinion, are of vital importance.” “ Personally, I entertain a very  
 “ very strong opinion in favour of receiving aid from the Government. I cannot help  
 “ feeling, when I come to London, and I go to Jermyn Street, to Kensington, or  
 “ elsewhere, and I find Government money applied, I do not say otherwise than very  
 “ properly applied, for the purposes of instruction, that London is not the best  
 “ place for teaching many of those sciences. You have no means of seeing their  
 “ application . . . .”

Mr. Bell would not “ desire, that such schools should be entirely supported by the  
 Qu. 9159. “ Government.” He considers that “ the best guarantee which a community like that  
 “ of Newcastle can give to the Government, of the necessity of establishments of this  
 “ kind, is by doing something themselves, and asking the Government to assist to a  
 “ certain extent.”

86. We concur to a considerable extent in the opinions expressed by these witnesses.  
 The degree of success which has attended the College of Physical Science at Newcastle-  
 upon-Tyne, both in the collection of local subscriptions and in the organization of its  
 system of instruction, leads us to express with confidence the hope that by further efforts  
 of the same kind it will before long be placed in a position to establish its claim to assist-  
 ance from the State.



#### IV.—THE CATHOLIC UNIVERSITY OF IRELAND.

87. The following account of the establishment of this Institution is given in its See App. V. Calendar for the year 1869:—

“The foundation of a Catholic University in Ireland, upon the model of the Catholic University of Louvain, had been strongly recommended by Pope Pius the Ninth, in the Rescripts by which he condemned the Queen’s Colleges, and was formally resolved upon by the National Synod of Thurles in 1850. In order to carry out this intention, a committee was appointed, consisting of the four Archbishops, four Suffragan Bishops, eight other ecclesiastics, and eight laymen. The business of this committee was to make the public familiar with the objects of the University and the means necessary for securing its establishment, to collect funds, to arrange the details, and take all the other necessary steps for the actual opening of the University. The first public collection was held on St. Patrick’s Day, 17th March 1851.

“At length, in May 1854, the bishops, assembled in synodal meeting in Dublin, canonically erected the University. The first Rector, the Very Rev. J. H. Newman, D.D., was installed on Whitsunday, 4th June, following. In the autumn of the same year several Professors were appointed, and the Schools of the University were formally opened on the feast of St. Malachi, 3d November 1854. The Pope was again pleased to express his approval of the work by a special brief, in which he bestowed on the new Institution all the canonical rights and privileges held by other Universities, and gave to the Rector the faculty of conferring degrees.”

88. By the Statutes of the University, as approved by the Episcopal Board in 1869, its government is vested in the hands of a Rector, assisted by a Rectorial Council, consisting “of the Vice-Rector, the Dean of Faculties, one of the Heads of Colleges or Collegiate Houses (to be elected annually by the others), and six additional members to be chosen annually by their respective Faculties, viz., two representatives from that of Philosophy and Letters (one from each of its divisions), and one representative from each of the others.” There is besides a Senate, “composed of the Vice-Rector and Secretary, the Professors, permanent Lecturers, and the Heads and Tutors of Colleges or Collegiate Houses.” With regard to the Senate, it is further provided that “those who, hereafter, being of at least seven years’ standing, shall have taken the degree of Master, Doctor, or other of the higher degrees, in the University, may be admitted Members of the Senate, on such conditions as the Senate itself shall fix.” All the authorities of the University are subject to the control of the Episcopal Board, consisting of the Roman Catholic Prelates of Ireland. The Rector, Vice-Rector, and Bursar are appointed by this Board, with power of revocation, “*pro nutu et arbitrio*.” The definitive appointment of the Professors also rests with the Bishops; but “whenever a Professorship is to be filled up, it is the duty of the Rector, having consulted the Faculty in which the vacancy occurs, to present to the Bishops the names of (at least) three candidates.” All the officials of the University, “though subject to removal by the same power that appointed them, are secure of the permanence of their appointments till they forfeit them by some offence against religion or morals, by insubordinate conduct, contentiousness, incapacity, or other obvious disqualification, according to the judgment of the Cœtus Episcoporum, or the Episcopal Board of the University.”

89. The intentions of the founders of the University were that it should be organised upon a very complete scale. Accordingly, the original plan embraced five Faculties: Theology, Law, Medicine, Philosophy and Letters, and Science. The Faculty of Theology, although provided with professors, and granting theological degrees, is not in operation as a teaching Faculty. The Faculty of Law has also been constituted, and Professors have been appointed; but we do not learn from the evidence that any system of instruction has as yet been commenced in this Faculty. The Faculty of Medicine, however, has had a fair measure of success, and in the academical year 1873–4, which has just come to a close, had 86 students. The number of resident students in Science and Arts was, in the same year, 30. Appendix V., p. 36.

90. The Professorships which it was intended to establish in the Faculty of Science were as follows: (1.) Mathematics, (2.) Physics, or Natural Philosophy, (3.) Chemistry, (4.) Geology, and Mineralogy, (5.) Botany, (6.) Zoology, and (7.) Physiology, to which (8.) a Professorship of Astronomy was to have been added. The Chairs that have been actually established are those of Mathematics, Natural Philosophy, Chemistry, and Physiology. There are, however, Lecturers on Botany and Zoology, and on Geology.

91. The resources of the University have always been very limited. At the time of its foundation a fund was subscribed, which in the year 1855 amounted to 58,070*l.* 1*s.* 5*d.* Of this sum 27,616*l.* had been collected in Ireland, 16,000*l.* in the United States, 4,166*l.* in England and Scotland, and the balance in different Roman Catholic countries. The University since that time has been supported by voluntary contributions, obtained chiefly by an annual collection in the Roman Catholic churches of Ireland. The whole sum contributed up to the present time, including the original fund and a recent bequest of 2,000*l.*, amounts to about 187,000*l.* Of this sum, 10,000*l.* was raised in the year 1873–4. Appendix V., p. 36.

Qu. 13,370. 92. A comparatively small part of these funds remains unexpended. About 18,500*l.* was invested in the purchase of buildings; about 2,500*l.* was expended on laboratory fittings, apparatus, and specimens (exclusive of those in the mineralogical cabinet); and about 5,000*l.* was lost in the course of the proceedings in connexion with the Clonliffe estate. But by far the larger part of the money contributed has been treated as income, and has been applied year by year to the maintenance of the Institution, and to the payment of the stipends of the Professors. Dr. Lyons says:

Appendix V. "The annual expenditure for maintenance and Professorial stipends has been about 6,000*l.* per year, and has been this year increased to about 7,000*l.* Of this sum over 5,000*l.* are absorbed in the salaries of Professors and officers.

"Not less than 10,000*l.* a year would, however, be required to maintain the Institution in a moderate degree of efficient work, and at least twice that sum annually if it is to be developed to meet the full requirements of the Catholic population of the country."

App. V. and Qu. 13,451. "The amount required for the Professorial stipends is explained by the statement that "the fees paid by University students in the Faculty of Science are little more than "nominal, and are paid into the University chest." The stipends of the Professors in the Faculty of Science are estimated at about 300*l.* per annum.

93. At one time it was in contemplation to erect very large University buildings. In accordance with the suggestions contained in a Report laid before the Episcopal Board by the Professors of the Scientific Faculty, the Clonliffe estate, a piece of ground of the extent of 34 acres, upon the north side of Dublin, was purchased at a considerable cost; plans were obtained, and the foundation stone was laid on the 20th of July 1862, it being hoped that no less a sum than 200,000*l.* might ultimately be provided. The University, however, became involved in litigation with a railway company, and was ultimately obliged to abandon its purchase. It has also failed, owing to legal difficulties, in an attempt to extend its original site in St. Stephen's Green, which it still occupies, and which has a frontage of 270 feet and 260 in depth. It appears, however, that, if funds were forthcoming, there would be no difficulty at the present time in obtaining additional ground. The present buildings are stated to possess considerable commercial value, but not to be very well suited for the purposes to which they are applied, although there are some rooms of considerable size. The Museums and Laboratories are described as having been adequate to the wants of the time when the University was first founded, but we infer from the evidence that they would require very considerable extension to meet the more recent requirements of Scientific teaching.

Qu. 13,415. 94. It has been already stated that the University grants degrees in Theology. In point of law, it does not possess the right to grant degrees in that, or any other Faculty; and, as a matter of fact, it has never granted any other degrees than Theological ones, not desiring to raise any question which might bring it into collision with the authority of the Crown. Nevertheless, examinations for the degree of Bachelor of Arts and Bachelor of Science are advertised in the Calendar referred to above; and the degrees of Bachelor and Master of Arts are recognized in the Statutes. As is well known, it has been a standing subject of complaint by persons interested in the Catholic University that the privilege of conferring degrees has never been conceded to it. They state that "the "fact of attaining a degree in an University is one of the most potent incentives to "students to flock to the University, and no matter what inducements in the way of "scientific teaching are held out, where a degree cannot be got in the end to cap a "student's labour, and so present to the public a proof that he followed an University "career, it adds enormously and incalculably to the difficulties which any teaching body "so circumstanced has to contend against.

Q. 13,390. "We have "constantly addressed successive Governments on the subject, and as it is a matter of "public history and notoriety, you are aware that the subject has been in one way or "another before the public now for many years, and some tentative efforts towards its "solution have been essayed by more than one Government." The University has adopted the title of Scholar for those students who, having reached the middle of their course, have attained a certain degree of proficiency; but it has been found that this title is not practically recognised by the public, and that no value is attached to it comparable to that which is attributed to the old degrees.

Qu. 13,391. 95. There is a considerable number of Scholarships and Exhibitions in the Catholic University; and as much as 700*l.* per annum is expended in this manner. The regulations, however, vary from year to year. Only a small proportion of the scholarships is devoted to science. There are three Limerick Exhibitions for Mathematics, of the value of 40*l.*, 30*l.*, and 20*l.* respectively; two Conolly Exhibitions for Mathematics of 20*l.* each, and two for Experimental Science of the same value, viz., one for Chemistry, and the other for general Physics. These exhibitions are all given away yearly, and are tenable for a year.

Qu. 13,372.



96. The courses of scientific study, as described in the Calendar, appear to be organized with as great an approach to completeness as the limited numbers of the professorial staff allow. We are not informed that there is any laboratory instruction in Physics, although the cabinet of physical apparatus is described as having been fairly complete at the time when it was formed, and although the lately-appointed Professor of Natural Philosophy has given a sum of 750*l.* to supplement the stock of apparatus with instruments required for efficient teaching. The practical instruction in Chemistry has been very successful, and acquired a very considerable development under the management of Professor Sullivan, who, till lately, held the Professorship of Chemistry. The Chemical Laboratory belongs both to the Faculty of Medicine and to the Faculty of Science; and it is stated by Professor Sullivan that it was the first laboratory in Ireland in which medical students received regular practical instruction in Chemistry.

Qu. 13,488  
and Appen-  
dix V.

97. The Students are divided into two classes, the Resident and the Non-Resident, or Affiliated Students, the latter being those who receive their education not in immediate connection with the University itself, but in Colleges in the country, which are affiliated to it, and which are visited and inspected by it. The Resident Students are either Interns or Externs. The Intern Students are those who reside in the Colleges, or Collegiate Houses, in Dublin (three such Houses are mentioned in the Calendar); the Extern Students are those who either live with their friends in Dublin or its neighbourhood, or who reside in lodging houses licensed by the Rector for the reception of students. Both these classes of students are, by the Statutes, and by the regulations published in the Calendar of the University, placed under very strict religious discipline, even the Externs being required to attend Mass and General Communion on certain days in the year, and being required on Sundays and other days of obligation to assemble in cap and gown before Mass, to answer to their names, and then proceed in a body to the church. But it is provided in the Statutes that, "with the permission of the Rector, and on payment of the proper fees, any person may attend the schools of the University or any particular course of Lectures. Such persons are called *Auditors*. Except in the lecture-room, they have no connection with the University, which is in no wise responsible for their conduct or their success in studies. . . . In order to become formally *Students*, and consequently Members of the University, entitled to all its privileges, the candidates for admission must pass the matriculation examination, and place themselves under the guidance and discipline of the University." And it appears from the evidence that non-Catholic Auditors have been constantly admitted to the lectures; and even to compete for and to hold exhibitions, although this last privilege is not secured to them by the Statutes. But, whatever may be the privileges of non-Catholic Pupils, it must be taken as certain that no dissident from the Roman Catholic religion could be admitted as a professor or teacher in the University. The Statutes require that each Professor shall make the Profession of Faith, according to the form prescribed by Pope Pius IV., in the presence of the Rector. The Rector, who must always be in Priest's orders, has to make the same Profession, in addition to the following promise:—"Ego N., nominatus Rector Universitatis Catholicæ, fidelis et obediens ero cœtui Episcoporum Hiberniæ et pro viribus juxta illorum mentem curabo honorem et prosperitatem dictæ Universitatis." The principle of the restrictions imposed by the Statutes is stated with great clearness by the present Rector, the Very Rev. Canon Woodlock, who says, in his address at the Inauguration of the Session of 1867-8, "Our Faculty of Medicine does not exclude Protestant Students from its lectures, but neither do our other Faculties. We recommend or prescribe, as the case may be, religious observances to the Catholic Medical Students under our care, as well as to our Students in Letters or in Science; but our rules on this subject do not comprise those who decline to accept the teaching of the Church. But there is one point on which we stand firm, and which equally regards our Faculty of Medicine and the other Departments of this University; we will have Catholic Students taught by no Professors save those whose principles we know to be in accordance with the teaching of the Catholic Church in faith and morals." It is stated in the evidence that there has never been any difficulty in finding Catholics qualified to fill the Professorial Chairs; but, on the other hand, in the Report of the Professors of the Scientific Faculty, to which we have already adverted, great importance is attached to the desirability of selecting for the Scientific Chairs persons who have been educated on the continent of Europe, owing to the impediments which up to that time prevented the cultivation of the Natural Sciences by the Catholics in Ireland. It is remarkable that the first Rector, Dr. Newman, at the time of the Foundation of the University, was prepared to admit non-catholics to the Professorships, on the ground of the importance of maintaining a high standard of excellence in teaching.

Qu. 13,398.

Qu. 13,396.

98. It is contended, on behalf of the Catholic University, that it might, if it could obtain a more complete development, be in a position to render great services to education



in Ireland. It is pleaded that the people of Ireland have very little knowledge of what an University education as distinct from a school education should be; that it is of great importance for them that they should have a Resident and Teaching University as opposed to a merely Examining University; and that neither of the two Teaching Universities—the Queen's University and the University of Dublin—commands the confidence of the large masses of the people. The comparative want of success which has attended the Catholic University is attributed, first, to its inability to grant degrees; secondly, to its want of funds, which has prevented the appliances for instruction and the courses of instruction from being made so complete as they ought to be; and, lastly, to the general poverty of the country, which precludes the existence of any large class of students able to support themselves for a sufficient time at the University.

Qu. 13,443.

99. Our attention has been also called to the relations between the Catholic University and the Catholic Schools in Ireland. Most of these schools are under the control of Roman Catholic Clergymen, and are greatly in need of Scientific Teachers. It is urged that it would be much more easy for scientific teachers educated in the Catholic University, and stamped, as it were, by its approval, to obtain appointments in such schools, and thus to spread a knowledge of Science in them, than it would be for teachers who had been brought up in a non-Catholic University. It is stated that the University has already in this way exercised a very beneficial influence upon the schools; there being but few of them that do not now attempt to teach a little Chemistry and some of the elements of Physics. The remarks of Professor Sullivan upon the present condition of the Irish Schools are certainly deserving of attention. He thinks, "that not more than 5 per cent. of the Catholics of the higher and middle classes go to any other schools than clerical schools. There are about 50 of them in the country, and those schools will not, and as a matter of fact do not, come in contact with any other educational institution in the country; they have no confidence in the present University of Dublin, and I may say they are in open hostility with the Queen's Colleges and the Queen's University, and, therefore, they have no source from which to get any inspiration in Science, no channel of communication with the scientific world, except through the Catholic University."

Qu. 13,456.

100. On a review of this evidence we are satisfied that the establishment of the Scientific Faculty of the Catholic University has not been without advantage to the instruction of the Irish people, an advantage which might be considerably increased if this Faculty could be more completely organized, and its Professors increased in number and supplied with adequate means for practical teaching. And we have not failed to observe that at the present time fresh efforts are being made by the persons interested in this Institution, to improve and to render more widely available the Instruction afforded by it.

101. It is also indisputable that the Catholic University has received, and still continues to receive, a large amount of pecuniary support. The permanency, however, of this support, which proceeds, to a large extent at all events, from annual subscriptions levied by clerical agency, cannot be predicted with any certainty.

102. The peculiar organization of this Institution; the religious restrictions imposed upon the selection of its Scientific Professors and Lecturers—restrictions the removal of which it would be idle to anticipate; the incompleteness of a large portion of its arrangements for the teaching of Science, and the uncertainty of its income; preclude us from recommending that it should receive a grant from public funds.

In conclusion, we humbly beg leave to submit this Report for Your Majesty's Gracious Consideration.

Signed)

DEVONSHIRE.  
 LANSDOWNE.  
 JOHN LUBBOCK.  
 J. P. KAY-SHUTTLEWORTH.  
 B. SAMUELSON.  
 W. SHARPEY.  
 T. H. HUXLEY.  
 G. G. STOKES.  
 HENRY J. S. SMITH.

J. NORMAN LOCKYER, Secretary,  
 August 4th, 1874.

# APPENDIX TO FIFTH REPORT.

## APPENDIX I.

### UNIVERSITY COLLEGE, LONDON.

6, Old Palace Yard, London,

May 29, 1874.

SIR, I AM directed by the Duke of Devonshire, the Chairman of this Commission, to ask you to be so good as to furnish the Commissioners with a statement of the salaries paid to the Scientific Professors at University College.

I have, &c.

J. NORMAN LOCKYER,

John Robson, Esq.

Secretary.

University College, London.

May 30, 1874.

DEAR SIR, HAVING been informed that the Commissioners on Scientific Instruction wish to have information on several matters in reference to this College, I beg leave to request you to submit to them the following statements:—

#### (I.) *The projected Extension of the College Buildings.*

I must premise that what I am about to say on this subject is founded upon inferences from various sources of information of an informal and unofficial kind, since the Council has not yet had the subject before them in any definite shape, nor adopted any resolutions upon it.

I believe, however, that if the Council had the necessary funds at their disposal, they would take steps to complete the two wings, already partly erected, and thus carry out the original design of the College, so far as its *extent* is concerned. Judging from estimates made at various times by our architect, I conclude that the cost of the work in question would be upwards of 40,000*l*.

Among the uses to which the additional buildings could advantageously be put, I may mention, in the first place, laboratories for Practical Physics, and for original physical research; next workshops attached to the Class of Engineering; accommodation of this kind has been greatly needed for several years past, and the want of it, there is good reason to believe, has been a serious obstacle to the full development of both the departments of the College affected by it.

Greater space could be beneficially devoted to providing more extensive and complete accommodation for the teachers and the students engaged in the classes of Chemistry and of Practical Physiology. As an illustration of the shifts to which we are at present driven to resort, I may mention that when Professor Sanderson recently represented to the Council his need of an additional laboratory for purposes of original research, the required accommodation could be obtained only by dislodging the museum of *Materia Medica*, which, at considerable expense, had to be removed into an upper and less convenient room.

Laboratories for original chemical research, and for the practical applications of chemistry, would also require much space as well as expensive fittings and apparatus.

The whole of the south wing, when completed, would probably be required for the use of the school, if, as there is every reason to expect, the number of its pupils should go on increasing for the next few years, as it has continuously for the past six or seven years. A large portion of this wing last built, which was finished in September 1873, having been assigned to the classes of Practical Chemistry and of Physics, to which subjects great attention is paid in the school, it is found that less accommodation than had been anticipated is available for ordinary classes, so that the school is already again cramped for space.

#### (II.) *The Financial Relations between the School and the College.*

This subject has recently been carefully investigated by the School Committee of the Council, and it has thus been ascertained that for the last five years—the most prosperous in the history of the school—the net amount received from the school by the College for its general purposes has been

only an average of 982*l*, 6*s*. 8*d*. per annum. But even this is subject to a large deduction for *rent*, which may be moderately estimated at 750*l*. a year for the south wing, and of 150*l*. for the portion of the main building still occupied by the school. Thus the actual profit derived from the school is reduced to about 100*l*. a year, or less than 1 per cent. of the gross income of the school.

#### (III.) *The Financial and other Relations existing between the College and the Hospital.*

For information on this subject, I beg leave first to refer the Commissioners to the preamble of the College Act of Incorporation, in pp. 4, 5 of the copy herewith sent to you. As to finance, I may state that the College discharges gratuitously all the duties of Trustee for the Hospital; it manages the investments of the hospital funds, conducts the correspondence connected therewith; acts as the guardian of the legal rights of the charity, and in various other ways carries on what may be called its *external* affairs, defraying out of its own funds the expenses incidental to its connexion with the hospital. Besides this, it pays each of the two Holme Professors, one of Clinical Medicine, the other of Clinical Surgery, a stipend of 100*l*. per annum, out of the income of the Holme Fund, which was bequeathed to the College "for the purposes of its Medical Department." The duties of these Professors are discharged wholly within the hospital, which derives an important part of its income from the fees paid by the students for hospital practice and clinical instruction.

Should the Commissioners desire me to attend them personally, I shall be happy to do so.

I remain, &c.

(Signed) JOHN ROBSON,  
J. N. Lockyer, Esq., F.R.S. Secretary.

P.S.—Since the above was written, I have received your letter of the 29th inst. I will obtain and send to you the desired information in a day or two.

The accompanying table, showing the proportion of U. C. Students who have obtained the degrees of the University of London, may be of some interest in connexion with the investigation conducted by the Commissioners.\*

University of London Degrees.	Total No. of Degrees conferred to end of 1873.	No. gained by Students of University College.	Per-centage of U. C. Degrees.
LL.D. - -	27	11	40·74
M.D. - -	281	108	38·43
M.S. - -	9	3	33·33
D.Sc. - -	20	6	30
D.Lit. - -	1	1	100
M.A., Branch I. - -	53	19	35·85
" II. - -	35	22	62·85
" III. - -	136	46	33·82
LL.B. - -	191	64	33·5
M.B. - -	274	74	27
B.S. - -	23	14	60·87
B.Sc. - -	118	29	24·58
B.A. - -	1,497	435	29·06
Totals - -	2,665	832	32·03

\* N.B. This table is based upon the Lists of Graduates published in the University Calendar for 1874, and it differs, therefore, in some respects from the general table printed in p. 154 of that Calendar, especially in omitting to take account of deceased Graduates, or of the lower degrees in the case of Graduates who have subsequently taken the higher degrees.



INCOMES of the under-mentioned Professors in University College, London, in Session 1872-73.

Subject.	Share of Fees.	Endowment.	Total.	—
1. Physiology	£ 468	—	£ 468	—
2. Chemistry -	1,484	—	1,484	—
3. Comparative Anatomy and Zoology.	104	100	204	—
4. Practical Physiology	368	—	368	—
5. Botany -	184	—	184	—
6. Hygiene -	10	—	10	—
7. Mathematics	370	—	370	—
8. Applied Mathematics.	123	200 guaranteed for 5 years only by the Treasurer of the College.	323	—
9. Physics -	252	—	252	—
10. Geology and Mineralogy	55	31	86	—
11. Engineering	102	—	102	—
12. Architecture	82	—	82	—

This is subject to a deduction of between 400*l.* and 500*l.* for payment of assistants and other expenses.

The professor has to pay for an assistant.

The Professor pays about 50*l.* for an assistant.

shall have entered to his class by the date of the fourth lecture, the course may be discontinued for the session.

2. Except with the permission of the Senate and of the Committee of Management, no Professor or other teacher shall fail to commence his course at his appointed time, or shall discontinue it before the appointed time.

3. Any Professor or other teacher having occasion to omit or postpone any lecture or lesson, shall, if possible, give notice to his class at a preceding meeting of his intention to do so, and shall also, as early as possible, give a similar notice to the Secretary.

4. A Professor or other teacher, by leave of the Senate, confirmed by the Council, may in alternate years omit giving his course of lectures.

5. The headle of each Faculty and of the Hospital is provided with a book entitled "*Register of Omitted Lectures*;" and it is the duty of the headle, whenever a lecture or attendance is omitted, to bring the book to the Professor or other teacher, physician, or surgeon, at his next attendance, in order that the omission may be registered with his signature. The books are laid on the table of the Committee of Management at every meeting, and the Committee report thereon to the Council whenever they deem it desirable to do so.

6. No class in the College is to meet at any other times than those announced for its meetings in the prospectus of the session, unless by express permission of the Senate and the Committee of Management. But this regulation is not to prevent a Professor or other teacher from holding an extra meeting of his class on an emergency, at an hour convenient to all the students of his class.

7. Each Professor or other teacher shall examine his own class; but the Faculty may, if they think fit, appoint one or more additional persons to examine any class. Copies of the questions proposed at the class-examinations shall be deposited in the libraries.

8. The 21st part of the gross amount of fees (representing the difference between pounds sterling and guineas) paid in a session for the class or classes of any Professor or other teacher is first deducted and retained by the College. When, after such deduction, the fees so paid do not exceed 125*l.*, nine-tenths of the amount are to be paid to the Professor or other teacher; when they are above that sum, but not more than 300*l.*, the Professor or other teacher shall receive 100*l.* and one-half of the remainder; when they are above 300*l.*, two-thirds of the amount shall be paid to the Professor or other teacher.

9. The sons of members of the Senate, of former members of the Senate who have died during their tenure of office, and of the Secretary, are admitted to all classes of the College without payment of fees. A similar privilege is enjoyed by the daughters of the same persons in respect of all College classes to which ladies are admissible.

September 1871.

UNIVERSITY COLLEGE, LONDON.

*Regulations made by the Council and the Senate, or by the Council, affecting Professors and other Teachers.*

1. Every Professor or other teacher is required to attend at the time appointed for the delivery of the first three lectures of his course or courses announced in the prospectus of the Faculty; but unless at least four students

## APPENDIX II.

### KING'S COLLEGE, LONDON.

6, Old Palace Yard, London,

REV. SIR,

May 19, 1874.

I AM directed by the Duke of Devonshire, the Chairman of this Commission, to enclose a statement furnished to the Commission by University College, and I am to say that the Commissioners would be glad to have a similar statement with regard to King's College, as they are now considering their Report with regard to these Colleges.

I have, &c.

J. NORMAN LOCKYER,  
Secretary.

The Rev. Dr. Barry.

King's College, London, W.C

May 28, 1874.

DEAR SIR,

IN compliance with your letter of the 19th inst., I have the honour to enclose herewith—

1. A return of the salaries paid in this College in 1873 to the members of the staff engaged in teaching various branches of Science. This Return does not include either the school or the evening classes.

2. A statement of the expenditure of the Council since the foundation of the College on lands, buildings, libraries, and museums. I have every reason to believe that this Return is accurate, but, without more time than I have at

my disposal before this Return is wanted, I am not able strictly to verify every item, but the Return is sufficiently accurate.

3. A Return showing the endowments which the College now possesses, and the particular objects to which each may be applied. We have no endowments applicable to general College purposes, except our buildings, which have been paid for by shares and donations. The College is otherwise wholly dependent on the fees received from students.

I remain, &c.

J. Norman Lockyer, Esq.,  
6, Old Palace Yard.

J. W. CUNNINGHAM,  
Secretary.

#### STATEMENT OF EXPENDITURE.

	£	s.	d.
Freehold lands, exclusive of site granted by the Crown - - -	16,448	0	0
College and School buildings and fittings -	146,899	0	0
Fittings for museums and laboratories -	5,738	0	0
Cost of books for general and medical libraries - - -	5,296	11	5
Cost of museum and laboratory apparatus	6,039	14	4



## KING'S COLLEGE, LONDON.

## STATEMENT OF ENDOWMENTS.

Purpose of Endowment.	Annual Income.	Name of Fund.	Where invested.						
			Reduced 3 %.	Consols.	London and North-Western Railway.			Great Eastern Railway Company.	East India Railway.
					4 % Debenture Stock.	5 % Preference Stock.	4 % Preference Stock.		
	£ s. d.		£	£ s. d.	£ s. d.	£ s. d.	£	£	£
For the encouragement of the study in this country of the language and literature of China.	83 13 6	Chinese Endowment.	—	—	2,092 0 0	—	—	—	—
To encourage the prosecution of original research in Chemistry, founded by subscription in honour of the late Professor Daniell.	30 13 2	Daniell Memorial.	—	—	50 13 10	572 9 4	—	—	—
“ For the specific purpose of providing Scholarships for meritorious Pupils educated in King's College School.”	92 17 3	Forest Scholars.	—	3,141 11 6	—	—	—	—	—
To provide for an annual course of lectures on the subject of Banking.	50 0 0	Gilbart Endowment.	—	—	1,250 0 0	—	—	—	—
To provide for Scholarships in Modern History and English Literature, in memory of the late Sir Robert Harry Inglis.	141 1 0	Inglis Endowment.	—	—	3,526 0 0	—	—	—	—
To provide for a bronze medal, to be given annually in each department of the School and College, in memory of the late R. W. Jelf, D.D., Principal.	10 0 0	Jelf Memorial.	—	—	—	—	250	—	—
To provide for divinity prizes in the Medical Department.	8 17 5	Leathes Endowment.	300	—	—	—	—	—	—
For an annual Hebrew and Old Testament prize, in memory of the late Rev. A. McCaul, D.D.	10 17 0	McCaul Memorial.	—	—	—	217 0 0	—	—	—
To provide for an annual gold medal (this is to be made up shortly to a sum producing 10 <i>l.</i> per annum.)	4 16 8	Mathematical Medal.	—	—	121 0 0	—	—	—	—
Towards forming an endowment for a Professorship of Commerce.	3 17 0	Professor of Commerce.	—	—	96 6 2	—	—	—	—
To provide an annual prize in Books for an English Essay.	1 14 0	Stephen Prize.	—	57 12 5	—	—	—	—	—
To provide for a Medical and Surgical Registrarship attached to the College and Hospital.	128 1 8	Sambrooke Registrarships.	—	—	452 0 0	—	—	2,000	—
To provide for a Professorship of Economic Science and Statistics, in honour of Thomas Tooke, Esq., F.R.S.	50 0 0	Tooke Endowment.	—	—	1,250 0 0	—	—	—	—
To provide for an annual Greek Testament prize, in honour of Archbishop Trench, late Professor of the Exegesis of the New Testament.	6 4 8	Trench Greek Testament Prize.	—	—	156 0 0	—	—	—	—
To provide for a medal and prize in Books to Students attending the Medical Clinical Lectures of King's College Hospital, in memory of the late R. B. Todd, M.D.	6 13 0	Todd Memorial.	—	—	—	133 0 0	—	—	—
To provide for a prize in the class of Obstetric Medicine in King's College Hospital, in memory of Dr. Thomas Hawkes Tanner.	10 10 0	Tanner Prize.	—	—	—	—	—	—	200
Given by the Rev. Samuel Wilson Warneford, LL.D., to provide for Scholarships at entrance to the Medical Department.	200 0 0	Warneford Scholarships.	—	—	4,400 0 0	—	—	—	—
Given by Dr. Warneford to provide for prizes in the Medical Department.	40 0 0	Warneford Prizes.	—	—	1,000 0 0	—	—	—	—
Bequeathed by Lieut.-General Sir Henry Worsley, K.C.B., for the education of Missionaries for the British Possessions in India.	64 19 7	Worsley Endowment.	—	2,197 16 0	—	—	—	—	—
Reversionary on the death of Miss S. A. Bequeathed by the late Thomas Godfrey Sambrooke, Esq., to provide for General College Scholarships.	—	Sambrooke Scholarships.	—	—	—	—	—	10,000	—

6, Old Palace Yard, London, S.W.  
May 29th, 1874.  
DEAR SIR,  
I AM directed to ask whether, in the statement which you have been so good as to furnish to this Commission respecting King's College, the sum of 146,899*l.* includes the expense of building the Hospital.  
I am, &c.

J. W. Cunningham, Esq. J. NORMAN LOCKYER.

King's College, London, W.C.,  
June 1, 1874.  
DEAR SIR,  
THE statement which I have made to you includes 5,000*l.*—five thousand pounds, which the Council gave towards the building of the Hospital, looked on as part of the teaching establishment of the College, but otherwise the whole sum has reference to the College buildings only. You can deduct 5,000*l.* from the 146,899*l.*, if you think it better to do so.

I have, &c.

J. W. CUNNINGHAM, Secretary.

J. Norman Lockyer, Esq.,  
6, Old Palace Yard.

6, Old Palace Yard, London, S.W.  
July 3, 1874.  
SIR,  
I AM directed by the Duke of Devonshire, the Chairman of this Commission, to ask you to favour the Commissioners with additional information with regard to King's College on the following points.

1. With reference to King's College School, the Commissioners would wish to know how far the financial arrangements of the School are kept distinct from those of the College?

Whether the School is at present a source of profit or loss to the College?

Whether the buildings used by the School have been constructed entirely at the charge of the College?

Whether the original establishment of the School involved any other charges to the College, and what the total amount of such building and other charges has approximately been?

Whether the arrangement by which one-fourth of the fees is reserved for the College extends to the School?

2. With reference to the list of salaries furnished by you on a former occasion (a copy of which I enclose), the Com-

missioners would ask you: (1) to add to that list the Professorship of Comparative Anatomy; (2), to fill up the blank relating to the Teachers of Drawing; (3), to verify the number (4) of Teachers of Mathematics, as three only appear to be mentioned in the Calendar; (4), to indicate, if in your judgment it can conveniently be done, what the salary of the principal Professor of each subject is, instead of only stating the gross amount payable to all the Teachers of each subject.

As the Commissioners are now considering their Report, they would be glad to receive these additional particulars as soon as you can conveniently send them.

I have, &c.

J. W. Cunningham, Esq. J. NORMAN LOCKYER.

King's College, London,  
July 10, 1874.  
DEAR SIR,  
IN reply to your letter of the 3d instant, I have to inform you,—

1. That in the College books a separate account is kept of the receipts and expenditure of each Department, and therefore necessarily of the School.

2. The masters are paid on the principle of receiving in the aggregate three fourths or thereabouts of the school fees. This is not so strictly carried out as in the College, but the effect is practically the same.

3. The one fourth of the school fees reserved to the Council more than covers the expenses of the school; so the school is a source of profit to the institution.

4. The cost of the school buildings is included in that of the College, and no separate account has been or could be made of school buildings.

5. (1.) The income of the Professor of Comparative Anatomy has never exceeded 50*l.*; for which he has given three lectures a week during May, June, and July, and one a week from October 1 to March 31 in the evening.

(2.) There are two teachers of Drawing.

(3.) Four Mathematical teachers are right. Mr. Heywood appears as a Classical teacher, but he has been for some years transferred to the Mathematical Side.

I remain, &c.

J. Norman Lockyer, Esq.,  
6, Old Palace Yard. J. W. CUNNINGHAM,  
Secretary.

### APPENDIX III.

#### THE OWENS COLLEGE, MANCHESTER.

6, Old Palace Yard, London, S.W.  
June 12, 1874.  
SIR,  
I AM directed by the Duke of Devonshire, the Chairman of this Commission, to ask you to be so good as to cause the statements desired in the accompanying memorandum, with regard to Owens College, to be furnished for the information of the Commissioners.

I have, &c.

The Principal of Owens College. J. NORMAN LOCKYER,  
Secretary.

Two statements, showing capital and expenditure under two divisions.

#### A.

Cr.—All available assets for buildings and fittings.

And against this—

Dr.—Money expended under the above head.

„ Liabilities under contracts already entered into under ditto.

„ Liabilities under other engagements, if any, under ditto.

„ Erections and fittings in addition to the above, forming part of the present plans, under ditto.

And deficiency on balance of Dr. and Cr.

#### B.

Cr.—Available assets for endowments.

And against these—

Dr.—The capital sum required to satisfy existing endowments.

„ To satisfy contemplated endowments.

And deficiency on balance of Dr. and Cr.

NOTE.—If any endowments for specific purposes should be in excess of the expenditure thereon, but incapable of being transferred to other endowments, state this in each instance.

The Owens College, Manchester,  
June 20th, 1874.  
DEAR SIR,

I SEND by this post answers to the questions received by me on the 13th inst. Our Treasurer, with the aid of an accountant, has been busily engaged upon the document which I now transmit for several days during the past week, and we hope that the accounts will be found both clear and well adapted for the purposes of the Commission. In one or two particulars, I am requested to say, it was scarcely practicable to frame these accounts *exactly* in accordance with the questions, but we believe that substantially your inquiries will all be found adequately and clearly answered.

I am desired, however, by my colleagues on the council to draw attention to one important particular. The deficiency on our building account (Account A.), will be seen to be estimated at about 22,000*l.*, whereas in the statement recently supplied by me by way of correction, up to the present date, of the accounts given by me in March 1871, this deficiency was spoken of as about 5,000*l.* It is necessary therefore to point out the source of so large a discrepancy. The explanation is as follows: my corrections of the former figures were drawn from a recently prepared *annual* statement for issue to our subscribers, in which no account was taken of augmentations due to additions to, and modifications of, the original contracts, whereas in the statement now supplied this source of prospective expenditure has been carefully estimated and included. By this and possibly one or two minor sources of error, the difference between the two statements will be found fully accounted for.

Allow me to add that any elucidations, should they be found necessary, will be readily furnished by us, and believe that I am

Your faithful servant,  
J. Norman Lockyer, Esq. J. G. GREENWOOD.





## MUSEUM TRUST FUND.

Dr.	INCOME.		EXPENDITURE.	Cr.
		£ s. d.		£ s. d.
Balance from last year	- - -	443 10 6	Salaries and wages, chief rent, interest, rates, and taxes, cleaning, &c.	- 2,298 6 9
Rents and contributions towards expenses, and sale of old furniture and fittings	- - -	290 18 6		1,183 15 4
Balance	- - -	449 6 4		
		£1,183 15 4		£1,183 15 4

## BALANCES.

	£ s. d.		£ s. d.
From Medical School	- - - 586 0 7	From General Fund	- - - 2,298 6 9
Total estimated deficit	- - - 2,161 12 6	From Museum Trust	- - - 449 6 4
	£2,747 13 1		£2,747 13 1

## THE OWENS COLLEGE, MANCHESTER.

Capital invested.	Description of Investment.	To what Fund belonging.	Rate of Interest per Cent.	Annual Gross Amount of Interest.
£ s. d.				£ s. d.
500 0 0	Corporation of Manchester bond	Victoria Scholarship	4	20 0 0
500 0 0	Mersey Docks and Harbour	Wellington Scholarship	4½	22 10 0
500 0 0	Corporation of Manchester	Dalton Scholarship Prize Fund	4	20 0 0
4,125 0 0	Ditto	Shuttleworth Scholarship Fund	4	165 0 0
1,250 0 0	Ditto	Shakespeare Scholarship Fund	4	50 0 0
1,071 0 0	Ditto	Cobden Professorship and Prize Fund	4	42 16 8
1,942 0 0	Ditto	Engineering Instruction Fund	4	77 13 8
9,472 15 0	Ditto	Ashbury Endowment Fund	4	378 18 2
3,500 0 0	Mexican Railway	Political Economy Lecture Fund	8	280 0 0
1,396 0 0	Corporation of Manchester	Geological Professorship Fund	4½	55 16 10
300 0 0	Mersey Docks and Harbour	Law Professorship Fund	4½	13 10 0
200 9 10	Corporation of Manchester	Medical School Fund	4	4 0 4
500 0 0	Ditto	Dunville Surgical Prize Fund	4	20 0 0
2,667 14 0	Uninvested	Shuttleworth History Prize Fund	say 4	106 14 2
500 0 0	Corporation of Manchester	Brackenbury Professorship Fund	4	20 0 0
1,012 14 0	Mersey Docks and Harbour	Turner Medical Prize Fund	4½	45 11 4
5,000 0 0	Corporation of Manchester	Platt Physiological Scholarship Fund	4	200 0 0
500 0 0	Mersey Docks and Harbour	Rumney Scholarship Fund	4½	22 10 0
80 0 0	Corporation of Manchester	Ramsbottom Scholarship Fund	4½	3 4 0
5,000 0 0	Ditto	Langworthy Endowment Fund	4½	200 0 0
618 16 0	Mersey Docks and Harbour			27 16 10
2,500 0 0	Ditto			112 10 0
1,000 0 0	Ditto			45 0 0
1,000 0 0	Ditto			45 0 0
10,000 0 0	Recently received and not yet invested			
55,136 8 10				£1,978 12 0

## APPENDIX No. IV.

## COLLEGE OF PHYSICAL SCIENCE, NEWCASTLE-ON-TYNE.

6, Old Palace Yard, London, S.W.

July 6, 1874.

SIR,

I AM directed to ask you to be so good as to supply for the information of the Commissioners (in addition to the information which you have already been good enough to furnish respecting the College of Physical Science, at Newcastle-on-Tyne); (i.), a financial statement, showing the amount received towards establishing and endowing the College, and how the amount has been expended or invested; and (ii.), the annual receipts and expenditure, indicating the salary paid to each professor.

I have, &amp;c.

The Secretary,  
College of Physical Science,  
Newcastle-on-Tyne.

College of Physical Science,  
Newcastle-upon-Tyne,

DEAR SIR,

July 11th, 1874.

In reply to your inquiries of the 6th inst., I beg to inform you that the total amount of donations promised to the College was 23,147*l.*, and of this sum 19,560*l.* has

been collected, the payments being extended over a term of six years. In addition to these donations the following annual subscriptions are received: three of 100*l.* each, one of 20*l.*, and one of 10*l.*

The University of Durham makes an annual grant of 1,000*l.*, besides some additional payments to extra teachers, &c.

Rather more than 1,000*l.* per annum is received for fees, about two thirds of which is paid over to the Professors, in addition to their stipends.

About 15,500*l.* of the donations received has been invested in railway and other stock, the balance having been applied in establishing and partly maintaining the College, which has been nearly three years in existence. The total annual expenditure of the College may be stated at 3,000*l.*, and the receipts hitherto have nearly equalled that amount, a deficiency of only 250*l.* last year having been drawn from the capital account. It is expected, however, in future that the expenditure will not exceed the receipts.

I am, &amp;c.

The Secretary of the  
Royal Commission on  
Scientific Instruction.

THRO. WOOD BUNNING.

## COLLEGE OF PHYSICAL SCIENCE, NEWCASTLE-UPON-TYNE.

Account of the number of students attending the various classes, Session 1873-74.

Total day students	-	-	78
First year students	-	-	57
Second year students	-	-	21
From Medical College	-	-	23
Total evening students	-	-	42
Mathematics	-	-	34
Do. evening advanced	-	-	—
Do. do. elementary	-	-	16
Chemistry	-	-	61
Do. evening	-	-	14
Laboratory	-	-	46
Geology	-	-	31
Do. evening	-	-	—
Experimental physics	-	-	36
Do. eveping	-	-	22
French	-	-	9
German	-	-	4
Drawing	-	-	9
English history	-	-	2
Do. literature	-	-	1
Natural Philosophy	-	-	—
Latin	-	-	5
Greek	-	-	4
Political Economy	-	-	—

College of Physical Science, Newcastle-upon-Tyne,

SIR, July 15, 1874.  
We think it desirable to bring before the notice of the Royal Commission on Scientific Instruction the fact

that since the time when evidence was given before the Commission by certain members of the College of Physical Science at Newcastle, some large subscriptions have been made to the Museum of Natural History, which now proposes to unite itself more closely with the College of Physical Science.

1. Sums equivalent to 30,000*l.* have been paid or guaranteed to the College of Science.

2. A subscription has lately been raised to found a memorial to the late Mr. Albany Hancock, and the sum promised amounts to 17,000*l.* It is proposed to devote this sum to a building for a museum to form part of a larger building for a College of Physical Science.

The sum thus subscribed would, if added to that already subscribed to the College of Science, amount to about 50,000*l.*; and it may be proper also to mention that the value of the museum itself and of its permanent building amounts to at least 10,000*l.*

In addition to this the Medical College of Newcastle is desirous to join in the erection of a joint college, and will subscribe the sum of 10,000*l.* for the purpose.

The Council of the College of Physical Science of Newcastle-upon-Tyne have thought it right to bring these additional facts before the notice of the Commission, as they have had no opportunity of doing this hitherto, and they venture to hope that the Commission may consider that sufficient grounds have been alleged to enable them to recommend that the College may be assisted by a parliamentary grant.

Signed on behalf of the Council,

W. C. LAKE,

J. Norman Lockyer, Esq. Dean of Durham.

## APPENDIX V.

## CATHOLIC UNIVERSITY OF IRELAND.

6, Old Palace Yard, London, S.W.,

SIR, June 20th, 1874.

WITH reference to the evidence given by you before this Commission on the 18th of July 1872, respecting the Catholic University of Ireland, I am directed by the Duke of Devonshire, the Chairman of the Commission, to apply to you for further information on the following points:—

I. The Commissioners desire to have laid before them a financial statement relating to the Catholic University. It appears from your evidence that "fully 150,000*l.* have been collected by voluntary contributions, mainly in Ireland, and applied to the purposes of the University." The Commissioners wish to know in what manner this fund has been applied, and, in particular,

(i.) What amount has been expended in the purchase of the site, and in the erection or adaptation of buildings?

(ii.) What amount has been expended in the purchase of objects for Museums, in the establishment of the Physical Cabinet, and of the Chemical Laboratory, and in other permanent appliances for the purposes of instruction?

(iii.) What amount has been expended year by year in the maintenance of the institution, and in the payment of the stipends of the professors and other officers?

(iv.) What was the amount lost in the legal proceedings referred to in your evidence, *qn.* 13,376?

(v.) What amount still remains invested in stock, or otherwise? Is the whole of such remaining amount applicable to the general purposes of the University, or is the application of any part of the same limited by special trusts?

(vi.) Have any sums been received by bequest in addition to the sum of 150,000*l.* mentioned by you; and if so, what has been the application of such bequests?

II. The Senate is described by you (*qn.* 13,368) "as an assembly of the entire University corps." Can you favour the Commissioners with a more precise definition of the constitution and powers of this body?

III. What was the number of medical students in any one year, for example, in the year 1872-73; and what was the number in the same year of students other than medical students?

IV. The Commissioners infer from your answer to *qn.* 13,376 that the present site of the University is its original one, and that no attempt to obtain an extension of that site, or an entirely new one, has hitherto been success-

ful. They would be glad to know if this impression is correct?

The Commissioners would also be much interested to obtain further information on two other points not expressly adverted to in your own evidence:—

(i.) In Professor Sullivan's evidence (*qn.* 13,426) it is stated that the chair of geology has been "established but not filled up." What is the state of the case at the present time with regard to this chair?

(ii.) The Commissioners would also be glad of more precise information on the points adverted to by Professor Sullivan in his answers to *qn.* 13,449-13,452. What were the emoluments in any one recent year, for example, in the year 1872-73, of the scientific professors; and how far were those emoluments derived from fees, and how far from the funds of the University? Are the fees of each student paid to the professors whose lectures he attends, or are they paid into a common fund.

(iii.) In the Calendar for the year 1869 (which the Commissioners have been informed is the last that has been published), it is stated that "the foundation of a Catholic University in Ireland, upon the model of the Catholic University of Louvain, had been strongly recommended by Pope Pius the Ninth, in the rescripts by which he condemned the Queen's Colleges, and was formally resolved upon by the National Synod of Thurles in 1850." The Commissioners would be glad to have these rescripts (if they are accessible in print) laid before them; and if not, to have some account of their general tenour.

Lastly, the Commissioners would desire to be informed of any changes of importance which may have taken place in the organization of the University since the date of your evidence; and, in particular, they would enquire, whether any other degrees than theological ones are now granted; and, if not, whether it is in immediate contemplation to grant such degrees?

As the Commissioners are now considering their Report on the evidence laid before them, it will be a convenience to receive the additional information herein requested at the earliest possible moment.

I have, &c.

J. NORMAN LOCKYER,  
Secretary.

Dr. Lyons.



SIR,  
8, Merrion Square West, Dublin,  
June 28th, 1864.

I HAVE the honour to acknowledge the receipt of your letter of 20th June 1874, on the part of His Grace the Duke of Devonshire, and other members of the Royal Commission on Scientific Instruction and the Advancement of Science, in which you ask for further information in addition to the evidence given by me on 18th July 1872, with regard to the Catholic University of Ireland.

In answer, I have the honour to furnish replies, so far as I am able, in the following returns to your various queries, taking them in order as set forth in your letter. I assume that you have copies of said queries, and I shall reply to them paragraph by paragraph, as numbered in yours of 20th June.

#### I.—FINANCIAL STATEMENT AS TO THE CATHOLIC UNIVERSITY OF IRELAND.

I find that by a Report of their Lordships, the Catholic Archbishops and Bishops of Ireland, addressed to Sir George Grey, Bart., under date January 1866, there had been furnished up to June 30th, 1865, by voluntary contributions in aid of the University a total sum of—

	£	125,000
From that period to 1872	-	45,000
In the year 1872-73	-	4,000
In the year 1873-74	-	10,000

184,000

This does not include a recent bequest of	-	2,000
Nor a sum devoted to the Physical Cabinet	-	750

In addition to the foregoing amount, considerable sums have, *de anno in annum*, been devoted to exhibitions, burses, and prizes of various amounts.

(1.) *Amount expended on purchase of site, &c., and on erection of buildings.*

The University has purchased at various times certain mansions and adjacent houses at the south side of Stephen's Green, lying together, and, as before stated, representing an area of 270 feet by 260 feet. These sites were purchased as occasions offered for the following sums—

£	4,500
	3,400
	1,100
	1,200

Church erected by the late rector, Very Rev. Dr. Newman, at cost of about 7,000  
Of which, however, only 2,400*l.* came out of the University chest, the remainder having been generously furnished out of his private funds by Dr. Newman himself.

Medical School	-	1,300
		18,500

It is to be observed that a considerable ground rent, amounting in all to about 200*l.*, is annually payable for great part of the above site, but the premises are held on long tenures nearly equivalent to perpetuity.

(2.) *Amounts expended on Museums, Physical Cabinet, and Laboratories.*

*Mineralogical Cabinet.*—Chiefly organised by Professor Sullivan: specimens numerous and valuable; amount expended not well ascertainable; collection believed to be of considerable value, and has been visited and examined by many eminent persons.

*Physical Cabinet.*—Amount originally expended about 500*l.*; for recent additions see answer to subsequent paragraph.

*Chemical Laboratory,* about 800*l.*

Fittings, &c., about 200*l.*

*Physiological and Biological Museum,* with specimens illustrative of comparative anatomy, about 200*l.*

(3.) *Amount expended, year by year, on the maintenance of Institution, and on Stipends of Professors, &c.*

The annual expenditure has been about 6,000*l.* per year, and has been this year increased to about 7,000*l.* Of this sum over 5,000*l.* are absorbed in the salaries of professors and officers. Salaries in Faculty of Science, 150*l.* to 400*l.* per annum.

Not less than 10,000*l.* a year would, however, be required

to maintain the Institution in a moderate degree of efficient work, and at least twice that sum annually if it is to be developed to meet the full requirements of the Catholic population of the country.

(4.) *Amount lost on Clonliffe Estate, as specified in Question 13,376.*

The amount already stated, 5,000*l.*, is believed to represent, as accurately as can be stated, the loss sustained in money, as it involved complicated legal and other procedures, rent, &c.; but the time involved was of great consequence to the prospects of the University. I should add that the loss is estimated by Mr. Seratton, Secretary (who is the person most familiar with all the facts), at nearer to 10,000*l.* in all.

(5.) *Amount of Corpus of Fund remaining invested in Stock.*

A part of the original fund remains in stock, which is applicable to the general purposes of the University, but is not now very large, having regard to the continuous expenditure on site, buildings, salaries, material, &c.

(6.)

Bequests have from time to time been made to the University, one recently of 2,000*l.*, as before specified, which have been applied to the general purposes of the University. There are no special limitations or special trusts, except in regard to certain of the prizes, burses, &c.

#### II.—POWER AND CONSTITUTION OF SENATE.

I beg leave to enclose the Statutes governing the Senate. I desire to call attention to the fact that provision is made for the admission of Graduates of the University to the Senate, and the carrying out of this large and liberal provision is only impeded by the want of legal recognition of the University.

#### III.—NUMBER OF STUDENTS.

In the current year 1873-74, which has just come to a close, the number of students

In Medicine was	-	86
In Science and Arts, attending lectures in the University buildings, Stephen's Green	-	30

It is, however, to be observed under this head that the examiners from the University visit periodically various schools and colleges affiliated with the University, and examine students for matriculation and honours.

Furthermore, students from various parts of the country attend at the University from time to time for examination, and in the current term not less than 40 thus submitted themselves for examination.

#### IV.

The present site is the original site, and if funds were now forthcoming an opportunity exists for acquiring a large accession of valuable and most suitable ground in immediate proximity to the University. Another site, with more ample grounds, has been pointed out by myself, and could, I believe, be acquired if the necessary funds were available.

In reply to your further queries, I beg to say (1) in reference to Question 13,426, as to the Chair of Geology: Owing to want of funds no permanent appointment has been yet made to this Chair, but a temporary provision has been made by the nomination of Professor O'Reilly, of the Royal College of Science, as lecturer. He has delivered a full and valuable course in the course of this session, ably illustrated by his own hand drawings, which are of great excellence.

(2) In reference to Questions 13,449-13,452, as to emoluments of professors:

The fees paid by University students in the Faculty of Science, are little more than nominal, and are paid into the University chest.

(3) In reference to the Rescripts of Pope Pius IX., I beg leave to enclose copy of the Synodical Address of the Council of Thurles, appended to which will be found the texts of the rescripts in question.

(4) In reference to degrees. No degrees other than theological have been granted. So far as I am aware, it is not contemplated to confer degrees in the other Faculties, but it is under consideration to grant certificates testifying the result of the examinations.

In conclusion I beg leave to say that some important additions have been made to the *matériel* and to the



strength of the University Staff, particularly in the Faculty of Science, since the date of my evidence, as I will now proceed to explain.

*Physical Cabinet.—Instruments.*

In addition to the instruments in regard to which evidence has already been given, a sum of 750*l.* has been recently furnished by the present Professor of Natural Philosophy, out of his private means, to supplement the stock with instruments required for the efficient teaching of Physical Science. (Rev. Dr. Molloy, *vice* Professor Hennessy, F.R.S.)

The Professor is just now engaged in improving at considerable expense the material arrangements of his Lecture Hall, and fitting up a Physical Laboratory in connexion with it, for the preparation of his Class Experiments and for the purposes of private research. The actual number in daily attendance on this class is now 23. Annexed will be found a Syllabus of the Lectures delivered in the present term.

Besides his systematic Class Lectures, the Professor proposes to give every year a course of popular public lectures on the most recent discoveries and inventions in Physical Science.

The Professor has also made a proposal, which is now under consideration, of giving from time to time short courses of systematic Elementary Lectures, to a class of select National Schoolmasters, chosen from the various schools throughout the country, thus fitting them to teach the elements of Physical Science in the primary schools. These lectures would be at first somewhat on the scale marked out in the Science Primers recently published by Macmillan & Co., and written by Professors Huxley, Balfour-Stewart, Roscoe, &c.; but he ultimately contemplates a much more enlarged course for this purpose.

The Professor hopes, with the means at his disposal, to be able to carry out these plans with moderate efficiency, but it is needless to say that to give them full effect on the scale contemplated, very large additions should be made to the resources of the University. It is believed that the Catholic University commands greater facilities for reaching the masses of the people in the matter of scientific education than any other existing institution in Ireland. Herewith is sent a syllabus of the lectures delivered in this department in the current term; also a copy of a work by the Professor, "on Geology in its relation to Revealed Religion." This book, it may be stated, has gone through two editions in this country, and has been republished and stereotyped in America, and a translation of it into French is now in course of publication in Paris.

*Higher Mathematics and Mathematical Physics.*

Dr. Casey has been appointed to this Chair. It is unnecessary to refer to his scientific position and attainments, or his qualification as an able and original teacher and investigator.

See *inter alia* his paper on Cyclides and Sphero-quartics, &c. (Phil. Trans.).

1. Dr. Casey has introduced in the course of Mathematics in the Catholic University the highest and most recent Mathematics.

2. He has already some preparations made, and intends immediately to commence the publication of a series of Manuals for the use of the University, and for the affiliated schools and colleges. In these he intends to bring the subjects up to the present state of information on the different branches of Mathematics of which they treat.

3. He also intends to propose to the Board of the Catholic University to bring the Mathematical masters of the affiliated schools and colleges to Dublin annually for examination, to divide them into three classes corresponding to Mathematical sizar, scholar, and moderator in Trinity College, Dublin, with a suitable salary to each class. He will himself instruct them during their vacations if they come to Dublin for that purpose, so that after a few years he hopes to have a number of able men as Mathematica masters in these affiliated colleges and schools.

*Other Appointments.*

Dr. Campbell has been appointed to the Chair of Chemistry in the Faculty of Science, and also in the Faculty of Medicine.

Professor O'Reilly has been nominated Lecturer on Geology, and has delivered in the current term an important and interesting course.

Dr. Sigerson has been appointed Lecturer on Botany and Zoology, and has delivered several courses well illustrated and largely attended. (See Prospectus enclosed.)

The Faculty of Law has also been constituted and Professors appointed.

PRESENT POSITION OF THE UNIVERSITY.

The position of the University in relation to the country since the date of my evidence is practically well illustrated by its increased efforts for the advancement of knowledge, and the important accessions to its teaching staff above referred to, while the large voluntary collection of the current year 1873-74 reaching 10,000*l.*, shows how these exertions have been appreciated, and how generously they have been met and supported by the Catholic people of Ireland.

In prizes and burses fully 1,000*l.* a year is now given by competition.

Within the last year direct affiliation has been effected with numerous Colleges and Higher Schools throughout the country, and the University is now in a position, if supplied with adequate material resources, to exercise an immense and an enduring influence on the higher scientific education of the people of Ireland. Through no other existing educational machinery can the various strata of the Irish people be reached, and if aid for Scientific teaching be withheld from the Catholic University, the cause of education in the Physical and Natural Sciences can make but little, if any, progress amongst the Catholics, who constitute the great majority of the Irish people.

I append a paper containing facts and arguments to show the educational wants and the intellectual resources of Ireland. (Herewith, "Intellectual Resources of Ireland. Supply and Demand for an enlarged system of Irish University Education," by Dr. Lyons).

I have, &c.

ROBERT D. LYONS.

## APPENDIX VI.

## STATEMENT of the SALARIES of the PROFESSORS in the ROYAL SCHOOL of MINES, and in the INDIAN CIVIL ENGINEERING COLLEGE.

RETURN of the SALARIES and LECTURE FEES paid to the Professors of the Royal School of Mines.

Name.	Professor of	Salary per Annum.	Average of Share of Lecture Fees during Five Years.
Edwd. Frankland -	Chemistry -	£ 200	£ s. d. 183 3 8
Thos. H. Huxley -	Natural History -	"	104 19 0
John Percy -	Metallurgy -	"	79 1 6
Warrington W. {	Mining and {	"	74 14 0
Smyth - {	Mineralogy - }	"	73 11 6
			148 5 6
Andrew C. Ramsay	Geology -	"	94 15 6
Thos. M. Goodeve	Applied Mechanics	"	66 2 3
Frederick Guthrie -	Physics -	"	107 3 1
J. H. Edgar -	Mechanical Drawing.	100	—

With reference to this return, I have to observe that the fees derived from the Students working in the Chemical and Metallurgical Laboratories are received by the respective Professors, with a distinct understanding that all the expenses of Assistants, materials, &c., with the exception of gas and fuel, are paid by those Professors. It is believed that the expenses in the Biological, Physical, and Mechanical Laboratories exceed the fees paid by the Students.

June 2, 1874.

TRENHAM REEKS,  
Registrar.

## INDIAN CIVIL ENGINEERING COLLEGE, COOPER'S HILL.

SIR, Cooper's Hill, Staines, June 1, 1874.  
In reply to your letter of the 29th ulto., I am directed by the President of the College to forward a statement of the salaries paid to the various Professors and Instructors of this College.

Four of the resident Professors who live in the College buildings have quarters unfurnished, with coals and gas; the other five occupy unfurnished houses within the College grounds, and receive an allowance of 35*l.* a year in lieu of coals and gas.

The non-resident Professors and Instructors receive no allowance in addition to their salaries.

I have, &c.

(Signed) J. BALL,  
Secretary.

The Secretary,  
Royal Commission on Scientific  
Instruction and the  
Advancement of Science,  
6, Old Palace Yard, S.W.

## SALARIES of the PROFESSORS and INSTRUCTORS of the INDIAN C.E. COLLEGE, Cooper's Hill.

Professor of Mathematics	-	£ 600
" Applied Mathematics	-	450
" Construction	-	700
" Hydraulic Engineering	-	450
" Experimental Science	-	600
" Surveying	-	600
Instructor in Surveying	-	450
" Geometrical Drawing	-	450
" Architectural ditto	-	350
" Free-hand ditto*	-	300
Lecturer in Hindustani*	-	350

The Lecturer on Geology receives a fee for each course of lectures.

\* Non-resident.

LONDON :

Printed by GEORGE E. EYRE and WILLIAM SPOTTISWOODE,  
Printers to the Queen's most Excellent Majesty.  
For Her Majesty's Stationery Office.















